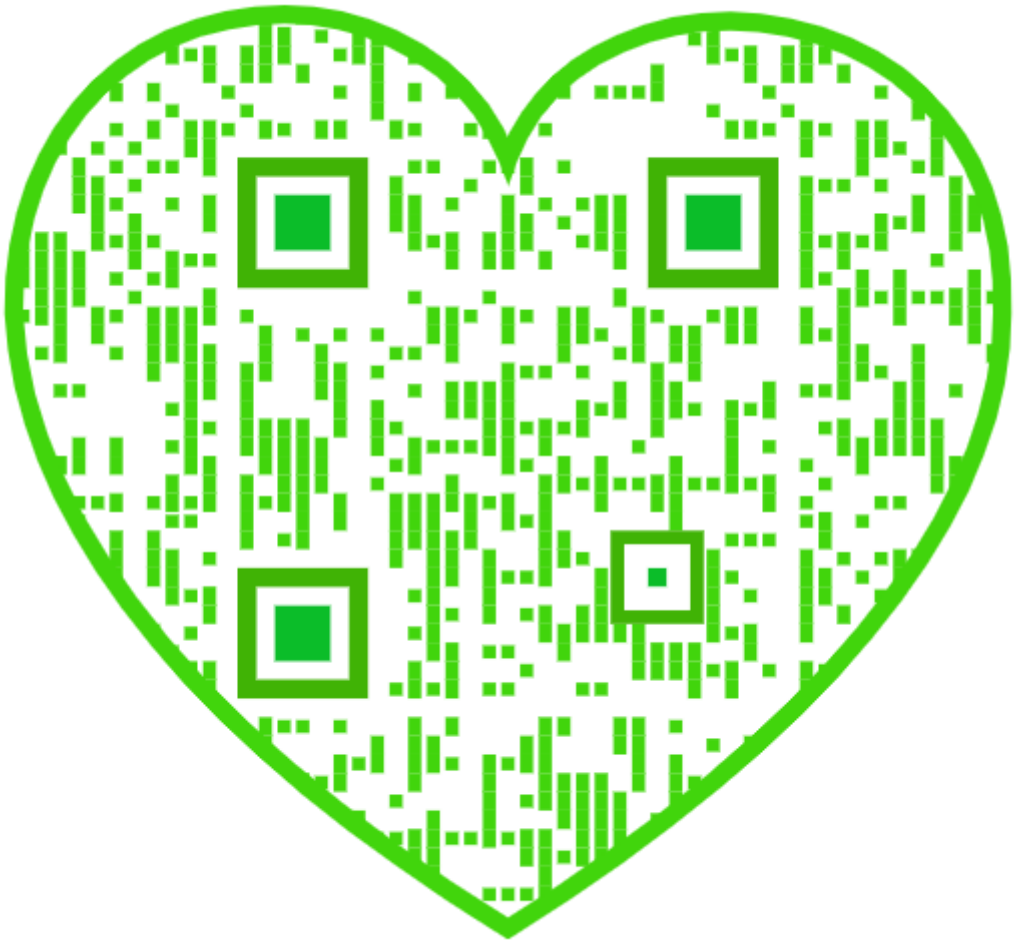
UC-NRLF

FRUIT FARMING FOR PROFIT

(UP TO DATE)

SIXTH EDITION

GEORGE BUNYARD, V.M.H.



LIBRARY
OF THE
UNIVERSITY
OF
CALIFORNIA

FRUIT FARMING FOR PROFIT

BY

GEORGE BUNYARD, V.M.H.

Fruit Farming for Profit

(REVISED TO 1911)

A practical treatise embracing chapters on all the most profitable Fruits, with

DETAILED INSTRUCTIONS FOR SUCCESSFUL COMMERCIAL CULTURE ON THE KENT SYSTEM

. . BY . .

GEORGE BUNYARD,

V. M. H.,

Chairman of the Fruit Committee, Royal Horticultural Society, and Member of Council;

Expert at Chiswick and Edinboro' Fruit Conferences;

Master of the Fruiterers' Company of London, 1906; &c., &c.

(For 50 years Manager of the Maidstone Nurseries).

SIXTH EDITION.

Maidstone:

VIVISH & BAKER, GENERAL PRINTERS, 28, KING STREET.

PRICE 2s. 6d.; OR FREE BY POST 2s. 9d.

COPYRIGHT.—ENTERED AT STATIONERS HALL.]

B92
1911

CONTENTS.

Chapter.		Page.
	Introductory Remarks	1
I.	Choice of Situation—Soil—Shelter	11
II.	Cultivation and Manuring	16
III.	Setting-out and Planting	23
IV.	Pruning in Commercial Fruit Culture	34
V.	Apples—Table and Kitchen	56
VI.	,, For Profit—R.H.S. Paper	67
VII.	Plums, Damsons and Bullaces	74
VIII.	Pears	79
IX.	Cherries	83
X.	Walnuts and Chestnuts	87
XI.	Gooseberries	88
XII.	Red and Black Currants	91
XIII.	Kent Cob Nuts and Filberts	93
XIV.	Strawberries and R.H.S. Paper	95
XV.	Rhubarb	107
XVI.	Raspberries	108
XVII.	Extra Fruits—Grapes, Peaches, Figs, etc.	110
XVIII.	Purchase of Trees, and Propagation	117
XIX.	Prices of Trees, Bushes, and Plants	122
XX.	Packing for Market	126
XXI.	Gathering and Storing	136
XXII.	Profits and Expenses	140
XXIII.	Insects, Diseases, and Enemies	148
XXIV.	Future of Fruit Growing and Market Weights	180
XXV.	Labelling and Fruit Naming	196
XXVI.	The R.H.S. Fruit Conference & Lord Onslow's Committee.	198
XXVII.	Summary of Year's Work	202
	Appendix	218
	Supplement	222

M5755G8

INDEX TO ADVERTISERS.

Page.

"The Kentish Express and Ashford News" ..... i.

The Insect and other allied Pests—Their Prevention and Treatment—Fred. V. Theobald, M.A. ..... ii.

Insecticides—Corry & Co., Ltd. ..... iii.

Victa Tree Grease—Howard Chapman ..... iv.

Abol Fruit Tree Wash—E. A. White, Ltd. ..... v.

Woburn Bordeaux Paste, etc.—Walter Voss & Co., Ltd. ..... vi.

Fruit Tree Pruners—Coppin & Sons ..... vii.

Spraying Machinery—Drake & Fletcher .... viii.

Reliable Salesmen :—
G. J. Bedford—Champion Bros.—R. Thurlow & Sons ..... ix.-x.

Fruit Growers' Specialities—G. Mence Smith ..... xi.

Kent Insurance Company ..... xi.

The Alpha Sprayer ..... xii.

"South Eastern Gazette" ..... xiii.

"Kent Messenger & Maidstone Telegraph" ..... xiii.

Vermorel's Eclair Knapsack Sprayers—Cooper, Pegler & Co. ..... xiv.

Bee Hives, etc.—C. T. Overton & Sons ..... xv.

Fruit Exhibitions ..... xvi.

,, Trees—George Bunyard & Co., Ltd. ..... xvii.

Tools and Insecticides ..... xviii.

Fruit Farming Adviser ..... xix.

,, ,, Literature ..... xx.

PREFACE

TO THE SIXTH EDITION.

IN preparing another edition of this book, I have again to record remarkable progress in the Fruit industry throughout Britain. Old ideas are giving way rapidly to modern systems, and although the main points of my first edition in 1881 are still reliable, we have recently learnt so much that is valuable and of practical importance, that the present edition is entirely revised, so as to bring it up to date in every particular.

The new facts brought out by the interesting Conference held by the Royal Horticultural Society, and the important conclusions arrived at by the Parliamentary Enquiry or Commission, instituted by Lord Onslow, before which I had the honour of being summoned, are herein enumerated.

The published Journals relating to these meetings are well worth study by all interested in fruit culture. (For notes see Chapter XXVI.)

The steady demand for this little brochure continues, and, the last edition being exhausted, I have endeavoured to bring together the latest information available in the present work, and have carefully revised and reduced the lists of sorts and given fuller hints on spraying and insect pests than before. The

importance of some operations has induced me to repeat them again and again, that they may not escape notice.

I offer this new edition to that generous public, who have shown their appreciation of my former endeavours to help on the better culture of hardy fruit in these Islands, and to inculcate such modes of treatment as shall enable British growers not only to hold their own, but to compete favourably with imports from abroad.

GEORGE BUNYARD, V.M.H.

The Royal Nurseries,
Maidstone, Kent.

INTRODUCTION.

CRITICS may still ask "Do you not think that fruit culture will be overdone? and in view of blights, spring frosts, and occasional gluts of produce, are you still justified in advising an extension of the industry?"

The author's reply is, that, living as he does in the greatest fruit-growing County, and being in touch with the largest growers elsewhere, he is still perfectly convinced that there is room for extension, but on modern lines. He would advocate the "Kentish system," which may be stated briefly as intelligent fruit cultivation, as distinguished from the old system of fruit planting at hazard. One fact alone will answer all pessimists. It is this: the largest growers—keen, hardworking, business men, who would be the first to feel lessening demand or the fall of prices below a paying scale—are yearly and constantly enlarging their acreage; and as they number their soft fruit produce by tons, and hard fruits by thousands of bushels, their action furnishes a complete reply.

But new growers must approach the business on modern methods—paying attention to the smallest details; cultivating those kinds that by name command market value; adopting the best system of grading, and endeavour to build up a reputation for honest packing and high quality; growing but few kinds and doing them well.

One incident will suffice to bring out the author's meaning. He visited a Scottish market, which was well attended by buyers, where the custom is for apples to be packed in one cwt. barrels. The inferior lots were first offered, and in many cases "turn 'em out" came from the crowd. This cry was justified; as bruised and under-sized fruits were mixed with good examples, and consequently sold at low prices. Then the auctioneer shouted "now we come to A. and B.'s fruit—you all know about that!" Bidding at once became brisk, and from these growers, fruit of the same varieties in many cases fetched three times as much as the first lots offered. This shows the advantage of quality and honesty. Had the growers of the inferior fruits sorted out the small and badly formed apples, and only marketed the best, they would have realized more money for them than they did for a bulk perhaps one third larger. A. and B.'s plantation is well known to the author, and every care is there given the year through to spraying, manuring, pruning and thinning the crops, so that they always secure the finest quality, while the trees being dwarfs, no ladders are needed for gathering; the fruit being within a man's reach for all necessary attention. The plantation consists of Apples, Pears and Plums, and the yearly average shows a good return for outlay; quality in a scarce year making up by high prices for deficiency in the crop.

Tariff Reform.—A reference to the Board of Trade figures will show the enormous sums Britain pays for imported foreign fruit, valued at over ten million pounds, half of which could be grown in Britain; regarding these imports, the author is not alone in

thinking the time has come when more consideration should be shewn to our home growers, and the taxation of the country be relieved by the imposition of a customs duty on all and every kind of fruit or vegetables imported from abroad, except supplies from our own Colonies. It is argued that such imports keep alive the public taste for fruits, and enable many country retail shops to tide over those months when our native fruits are not in season. This may be true; but, as growers well know, the higher prices they used to realise for early or very late produce are now seldom reached, and a small duty would not be felt by the consumer, while such an import duty must place our home growers in a more favourable position. Directly Strawberries, Cherries, Black Currants and Gooseberries reach our markets in quantity from abroad, prices drop, and seldom rise again, and it is the same with Plums and Apples. For example, Rivers' early black Cherries used to fetch 7/6 per peck of 12-lb.; in 1909, with a moderate crop, they only made 3/6. In Pears we may never be able to compete with French and Belgian produce, as their climate is more generally favourable for this fruit; but on the other hand, clean well-grown British Pears always make good prices, and all walls and buildings might be utilised to grow the finest varieties. Some wall-grown Doyenne du Comice Pears, made up to 12/0 doz. wholesale in 1909 and 1910, and other good sorts in proportion.

The culture of fruit, when carried out on a proper basis, can be depended upon to pay, but there must be (1) careful preparation of the soil; (2) choice of the best market sorts, and of clean well-grown trees

and bushes to start with; (3) active supervision and intelligent culture; (4) business arrangements as to the sale of produce; these four items are essential before planters can command success, and the aim of this volume is to give such plain and practical directions as a life experience alone can dictate, to enable amateurs or beginners to start fairly in this industry; while it is hoped that even experienced growers may find some hints to their advantage in these pages.

The author recommends the Kentish system as the best for results. He has studied fruit culture in many counties, but he can say, without contradiction, that where the Kent system has been faithfully carried out, failure is very rare, while numerous letters of thanks prove that the simple directions herein given are ample for success, if mixed with a due proportion of common sense.

Market gardening in vegetables has been advocated as a paying industry, and occasionally good profits are made; but it is far better to combine this with fruit culture, as the high cultivation necessary for good vegetables is a grand basis for fruit culture, more especially for Raspberries, Strawberries and bush fruits. Vegetable growing however is precarious, and unless markets are readily available, or the farm is near a city or town, for the double purpose of obtaining cheap manure and the sale of produce, it will be well to proceed in that direction with caution. It is only the very best vegetables that sell for good prices.

The extraordinary development of jam making has placed good wholesome preserves within the reach of the poorest, thus largely replacing the use of margarine

and low class butters; and as all British fruit is greatly superior to that grown on the Continent, an opening for export purposes in a preserved state should be developed; a vast quantity is used on the steam ships trading to the tropics, America, etc., while jam not infrequently is a part of a soldier's food in campaigns.

The Fruit Commission, whilst generally recommending the making of jam and bottled fruits, specially urges the inspection of all soft fruits and pulped fruit imported from the Continent, as much of this arrives in a condition unfit for human food. It is satisfactory to learn that many tons have been condemned and destroyed. No amount of heat or "doctoring" can make wholesome preserves of fermented fruits. The marking of jams made from foreign fruit was also emphasized.

A wholesome fruit mixture is compounded with prepared pulp composed of the cheaper Apples and Pears, mixed with a proportion of Raspberries, Currants, or Plums, which can thus be sold at a very low price.

It was thought that district jam factories would pay, but the venture has not been a success. It appears to be essential that factories should be situated in a fruit district, while at the same time water carriage for bottles and jars (as they are liable to breakage on rails through shunting, etc.), combined with a central railway service to all parts for redistribution, should be available. For that purpose London, Manchester, Liverpool, Glasgow, etc., seem to take the lead, their ports being available for Belgian glass and sugar.

By dint of perseverance some provincial firms command a first-class connection, although their factories are not central, but it is to the high quality and purity of their jams, jellies and bottled fruits that their well earned success is greatly due; while in winter and spring they make sweets, candied peel, etc., to keep their plant in order.

The Exhibitions of Bottled Fruit, held by the Royal Horticultural Society, has stimulated this industry, and several private people have made it a paying home industry.

The railway companies are now helping the fruit industry by special rates, properly ventilated cars and through trains, as well as by the sale of boxes for small parcels, which they carry at low rates, enabling small growers to work up a private connection; for example, the South Eastern and Chatham have adopted the system introduced some years ago with much success by the Great Eastern Railway Company, of conveying market garden and farm produce at low rates between the various stations. The conditions are (1) the produce shall be packed in boxes on sale at the different stations, or similar ones; (2) the boxes shall be secured by nails and not by rope or cord; (3) the produce shall be conveyed *at owner's risk*, and the *carriage be prepaid*, and (4) no box shall be of greater weight than 60lb.

Provided these conditions are fulfilled the produce will be conveyed at a reduced charge of 4d. for every 20lb, and 1d. for every additional 5lb. or any part thereof up to 60lb, including delivery within the usual limits from all stations. The boxes, which are intended for use once only, to avoid expenses of

return conveyance as empties, are sold at the stations at prices ranging from 1½d. to 5d. The adoption of this system should be of immense advantage to fruit growers and consumers.

HOME ORCHARDS.—Beyond culture for profit we would strongly advocate that every farm house should possess a selection of useful fruit trees for supplying its own household, preferably a spot near the house and in plantation rather than orchard form, when the trees gain in size the surplus fruit would probably pay for all expenses of culture and rent.—(See diagram in Chapter III. on "setting out.")

A WORD FOR BEGINNERS.—It frequently happens that those about to begin the culture of fruit are confounded by the mass of information they collect, and we would advise them to consult *but one good authority*, and act upon such advice; and further, as a plantation will not at once produce crops, any information as to marketing, and places of disposal need not be considered until required, as at starting all energy is needed to ensure careful planting, and keeping the land clean and in good working order; but proximity to a railway is desirable, though many Kent growers send five to seven miles to a station daily.

Looked at socially, fruit growing is a very important *gain for the labouring classes.* Girls and women do a great portion of the picking, thus supplementing the wages earned by the men and boys of a family. Many widows with families thus keep themselves in Kent, assisted by the hopping and the work among the hops; and except in wet weather, when of course little can be picked, it is not laborious work, and is

much liked by the women, who for the most part are paid by the day, or by the half-sieve or tally.

Another point is the winter work among plantations and orchards. In Kent many persons go round and prune trees by the "great" (or contract), such earn good wages, thus giving an intelligent man an advantage over less energetic labourers; and the digging, which is done per acre, enables a strong and willing hand to earn more than ordinary pay; while the winter packing is work for many, and where fruit is stored, wet days can be utilised in looking it over. Again, *basket making* can easily be learnt, and would afford employment at their homes for old couples, those who could not work otherwise; in fact this might be done *at the workhouse;* while osiers could be grown on wet land that is now desolate. Where Cob Nuts are cultivated there will annually be suckers or wands which are suitable for basket-making, always remembering to put by some of the best "wands" for packing. Some markets prefer fruit packed in hundredweight barrels, and others in boxes--this is treated further on. Fruit growing cannot fail in some degree to check the exodus to our colonies of some of our best farm workmen, and prove a boon to those who find a large family a burden in this country.

It is further a matter of *national importance* to keep the young men in the villages, to prevent that overcrowding in the towns which has such a serious effect on their physique, as the army returns show that the best and hardiest soldiers and sailors are recruited from country born lads.

In this book each kind of fruit is treated in a separate chapter, and although more varieties might be

added, the grower for profit must confine himself to a few recognised kinds. He can experiment in his private garden, planting as many as he chooses, selecting those that promise well, or which suit his soil and markets, for further extensions. It is so frequently remarked that we have "far too many kinds," that it need not be enlarged upon here. The few mentioned in this treatise are only a selection from 800 kinds cultivated in the Maidstone nurseries. If any great breadth is planted, a variety must be selected, otherwise the crop cannot possibly be gathered (more especially in the case of plums, which have a limited season); but this has its advantages, the possessor of a mixed orchard is rarely without fruit, and a great hit is often made in this way. Recent observations prove that it is necessary to intermix varieties to obtain cross fertilization of the blossom, and to this fact may be attributed the loss of crop where large quantities of one kind are massed. In this case the evil may be counteracted by grafting one tree in 20 with another variety which blossoms at the same period. In new plantations not more than three rows of one variety should be planted together. In our Allington nurseries we rarely fail to get a general crop, because of the great number of sorts grown. This fact of non-fertility has been proved by large blocks of one variety being found to fruit only on the outsides, or where they approach the proximity of a different sort. Each select list is supplemented by extra kinds, while we only recommend those within our knowledge, which have been proved by us for years.

Further useful tabulated information is given in the excellent fruit catalogues issued, and that sent out

by my firm is considered one of the best and most reliable.*

When planters begin to see results, they should avoid hastily heading down for re-grafting, or changing sorts too often; having done their best, they should not make alterations on the basis of one or two years' crops, but wait with faith and patience, gaining experience over a series of years before destroying any kind on a chance of bettering their selection.

The secret of success in fruit growing may be summed up in a very few words:—"Grow few sorts; keep the trees well pruned, and thin the boughs; manure freely and intelligently; and pack carefully." These four axioms thoroughly carried out will in a year or two more than double proceeds from Fruit growing carried on in a slovenly manner.

GEORGE BUNYARD, V.M.H.

The Royal Nurseries,
Maidstone, September, 1911.

---

* Illustrated Catalogue of hardy Fruits, with descriptive notes, prices, and much useful information, etc., post free, 6 stamps.

CHAPTER I.

SOIL—SITUATION—SHELTER.

SOIL.—Remarks on this must of necessity be general, as the superficial geology of an acre is often of quite opposite formations. If the soil is good all fruits will succeed, though possibly some may do too well; if poor, it can be enriched; if unsuitable for one crop, it may do for another; taking worst soil first, the *limestone* or the *chalk*, with only a surface layer of mould above it. This is manifestly unsuitable for Pears and Apples, Plums will succeed for a short time only, Damsons will not thrive, and Cherries may do for a time, the only crops that can be recommended are Strawberries, Cob Nuts, and possibly Morella Cherries on dwarf trees. If the loam on top be fairly deep, Gooseberries and Currants may succeed, but experiment in a small way before speculating. If *the chalk overlies gravel*, planters will be pretty much in the same state, but if the chalk is mixed on the surface with deep brick earth, then Plums will come in, and Cherries grow luxuriantly, but be careful with Apples and Pears until proved. As a guide in selecting a fruit site, give a look at neighbouring crops and to trees in gardens, and take note of those that flourish. In a *surface gravel over sand* there is a risk from drought, possibly such land will be happy in a wet time, but although some orchards on this formation are known, it is not recommended. In *sandy soil*

where there is brick earth below or even a loamy gravel, Red Currants will thrive, but will require manuring frequently. Most of the land around Maidstone is on the lower greensand, and suitable for all kinds of fruit; Plums do well; Apples are good, but the fruit is not so firm as from trees on heavier lands; all small fruits flourish; while where the rock is very near to the surface, Cob Nuts succeed admirably. The *flinty lands of East Kent*, where the soil is rather heavy, grow fine Cherries and Apples, but for general fruit nothing can be better than the very deep brick earth that is found in the valley from Chatham to Canterbury, where Pears grow clear in the skin, and take on a good colour, many kinds succeeding there on open trees, which require a wall in colder soils. All bush fruit is perhaps better grown in that district than any other; while the Cherries of Newington, Sittingbourne, and Teynham are the finest in the market, the trees attaining enormous dimensions Leaving this fruitful part for the *heavy lands in the Weald of Kent*, where there is a more or less loamy soil resting on the clay, we find some of our finest Apple orchards, the weight and colour of the fruit being remarkable, while here and there Cherries succeed admirably, and on the higher land Plums and Damsons are well grown. Even where the soil is so heavy, and the moisture so abundant that the trees are mossy and unhealthy, the land being in grass, regularly grazed with pigs or sheep, which are fed on cake or fodder, very fine fruit is grown, and much more might be done by thinning the boughs, and clearing the trees from moss. The stone shattery land in the neighbourhood of Orpington, and the

Crays, where it overlays and mixes with the gravel, is remarkably suitable for Pears, Apples, Plums, Raspberries, Currants, Gooseberries and Strawberries. *Land that is wet*, but is not flooded, will grow Black Currants, but other fruits are not at home in such places. Land with an inclination to the south-west, or west, is preferred. The Boughton, Linton, Chart, and Sutton Hills are clothed with fruit, and are among our best Kent plantations, while the wet land about Mereworth is well fitted for Cob Nuts and Apples, and the drier portions for Plums. This fact thus stares us in the face—that with care and proper drainage fruit can be grown, and in many cases well grown, in soils that a casual examination would condemn; and as fruit succeeds in gardens while it fails in the orchards in the same soils, it appears in many cases to be only a matter of cultivation. It is certain that very much poor agricultural land will grow good fruit (excepting uplands and poor pastures) which could be brought round into fruit culture at a great expense. A proof of cultivation making fruit succeed in unlikely situations is often seen in Kent, where poor thin woodland is brought into cultivation. The Allington nurseries of my firm were all very poor woodland, and yet the soil there produces the very best of trees, and prize fruit. When orchards are started among hops, careful cultivation makes such land very suitable for fruit, where in time the hops are grubbed and the land laid to grass. It has been noticed that where Elm trees and nettles succeed orchard fruit flourishes. Although we have only alluded to the Kent soils, our remarks are applicable to all parts of Britain, where similar conditions prevail;

our intention is to give planters hints as to the kinds of fruit likely to suit their soils.

SITUATION.—Avoid planting in land unduly exposed to north, east or west winds, unless shelter belts are intended to be planted. Soil that is naturally drained is even preferable to land that requires artificial drainage. Avoid planting close to a river, stream or lake, although fruit is seen frequently doing well in such places, Apples even hanging over the water; but evening mists, rising from damp places, fall on the blossom, which being frozen early in the morning by spring frosts, produce fatal results. Bush fruits and Strawberries do not need shelter so much as orchard fruits.

Where prevailing winds are from the plantation to the water, such orchards may escape; but if you desire to plant, let there be a belt of alder, ash or willow, to separate fruit trees from the water. A little further away, Cherries, Pears and Apples will succeed, as there is generally a fine deep loam in such situations, and trees grow to a great size. Again, bleak hills and uplands are to be avoided, although the southern side may be tried, and in Kent there are some fine plantations of Cob Nuts, Damsons, and under fruit, in such unlikely places, which give good returns as the rent is low, but strong manure must be freely supplied.

The writer has been particularly interested in the fine examples of Apples received from Armagh in Ireland, from Cornwall and other outside quarters, proving that many more centres of production could be utilized. The red lands of Hereford and Worcester produce fine fruit. In wind swept counties the valleys are often very productive.

Of the importance of shelter too much cannot be said. Existing hedges should be allowed to grow up to 10 feet, and if necessary, some quickly growing trees, as Huntingdon Elm, Poplar, or Beech, with Larch, and Scotch Fir, should be planted a few years before the fruit is started. A big orchard can take care of itself, and the hedges may be lowered when the young trees get up. It is now the fashion, and a good one, to plant bush and Czar Plums, Damsons, Capiaumont or Chalk Pears, with the upright growing Mayduke Cherries, round the outsides of newly made orchards and plantations; these break the force of winds and screen the other trees, and they often fruit heavily, and thus give a profitable return.

CHAPTER II.

CULTIVATION—MANURE.

PREPARATION OF LAND.—A point that must be well considered is the thorough working and preparing the soil before planting, not trusting to after cultivation when the trees are planted; it is infinitely easier and cheaper to cultivate open land than to do so after the trees are set. Manure heavily for Strawberries and bush fruits; steam cultivate or double-plough ordinary soil, but trench stony ground thoroughly 2 feet deep; the stone found in trenching will partly pay for labour. With a clay subsoil it is not advisable to trench, the trees are better fed by manure on the surface.

ORCHARDS.—TREES ON GRASS.—Starting a fresh orchard, to be in time laid to grass. In Kent this is generally done among hops, but if it is intended to plant an arable field, let the trees be put in at regular distances, that the ground may be afterwards worked in the usual way with horses and ploughs, such an orchard can be cropped between the trees with potatoes, mangold, turnips, or any crop *except corn*. In planting trees on grass, holes should be dug 1½ft. or 2ft. deep and 3ft. over. (See also chapter on planting).

No fruit orchards in grass should be left for hay, the growth of tall grass is very detrimental to newly planted trees; always take care to give young standard trees a 6ft. circle round the stems, free from crop or weeds, this space must be kept clean and be regularly

hoed for six years. If an orchard is of Cherries you must not get too close with the plough after the second year, as they root on the surface; but with Apples, Plums and Pears you can continue horse work for some years, until the trees are of sufficient size and girth to be safe from attacks by sheep, when the land may be laid to permanent pasture, either by sowing in September or April, having previously made a good friable surface. Leaving out for the present the method of putting a cradle to each tree, which can be done afterwards if the land is wanted for a sheep and cattle run, the tree stems can be protected by a few boughs, or better, by an inch-mesh wire netting, which should be firmly attached to two stakes so that the animals cannot move it when rubbing themselves. In Kent we use the blackthorn or whitethorn bushes, which we obtain when cutting underwood; but even then sheep will be tiresome and apt to bark the trees when keep is low; they must always be watched. Horses or adult cattle should not be turned in, as they do great damage to young orchards. (See Protection).

FRUIT PLANTATIONS.—The cultivation here differs from orchards. These must be dug annually before Christmas, and require the first prong hoeing in March, and further plate hoeing afterwards once or twice in summer to keep down weeds. There is no objection to horse or donkey work here with a small and light "nidget" or "Planet junior" machine on the surface; but all digging should be completed before February. It may happen that land which is dug before Christmas will produce a crop of chickweed or summer weeds quite early in spring, this is an indication of good land, and it may be advisable to

defer the digging till February, but it is of great benefit to have plantations roughly dug in time for the winter frosts and snow to mellow the surface. In all cases digging should be performed with a spud, as it is important not to sever or injure the surface roots, and therefore the digging must not be too close to the trees or bushes, any weeds there can be skimmed off and be put underground.

HOEING.—The hoe is a far more important factor in fruit cultivation than is generally supposed. Many successful growers on light soils are discarding deep winter or spring digging with a heavy spud, for exclusive cultivation with the hoe. It is an acknowledged fact that the surface roots of a tree gain through hoe cultivation fuller advantage from stimulant manure and greater benefit from sunshine warmth, and thus become more fruitful.

In dry times, too, it is absolutely necessary to keep a fine surface tilth, as this alone will prevent evaporation and consequent harm from excessive drought. It becomes more manifest that surface cultivation, often repeated, is a dependable sheet anchor for the fruit grower, and that it will carry him through dry seasons and bad weather better than anything else. This is fully recognised and energetically practised by the most successful growers.

MANURE.—Orchard standards do not require any manure if the trees grow kindly and start regularly. If however they cease to make new growth, or the foliage is pale and unhealthy, a surfacing of half-rotten stable or cow dung round the stem will be required, say 6ft. wide, which should be applied in December and be turned in just under the surface (if

arable) in February, or be left upon the surface if the trees are in grass. In *plantations* the rule is to manure once in two or three years as requisite; some plantations may not require it for years, others where the soil is naturally poor for fruit trees and bushes, can be advantageously dressed yearly, the manure being placed on the land in winter, being dug in at once before its virtue is lost. In certain cases it is preferable to dig early, laying manure on the surface afterwards, as in light soils, with a wet winter, much of the nutriment from farm manure may be lost. This of course does not apply to shoddy, wool waste, rags, fur clips, etc., which are valuable stimulants for the purpose but decompose less rapidly. The advantage of these portable manures is the readiness with which they can be placed on the land; being in bags, one can be dropped here and there, to be opened and spread out before the diggers. Other manures used are sprats from the coast, London dung, road scrapings* and parings, the latter, when mixened with farm yard manure and sweetened with lime, is very useful; 20 to 30 tons per acre is a good dressing for bush fruits. The quantity of artificial manures used varies from one to two tons of the lighter kinds to the acre; sprats and powerful artificial manures, 5 to 10 cwt. It is sound policy to arrange the plantation so that each quarter may in turn have a share, thus spreading the cost over a number of years. Where the farm is in the neighbourhood of rivers, cheap freights of dung can sometimes be secured from the cities and towns, which can be stored for use, but it is better to purchase it so that it can be used at once. No doubt, on

* Road scrapings must not be used where the roads are tarred.

heavily cropped trees, liquid manure proves very advantageous, but it is difficult of application except in orchards; where however it can be arranged, it is doubly beneficial, applied in a wet time in the winter. In old orchards, well fed pigs, or sheep and lambs fed with oil cake upon the land, are a great stimulant to free growth, and consequently good fruit.

OLD ORCHARDS.—After the trees have been cleared of inside spray branches, the trees benefit greatly by a winter dressing of manure round each tree; but this must be placed at least 3ft. from the stem, and extend 6ft. further out in order to come in contact with the feeding roots. The manure may be from the stable yard, or, on light lands, Kainit; on clay soils, soot and guano.

A great help towards success in raising young trees is to impart all the vigour possible during the months of May and June, thus securing strong wood to become fully grown and ripened by the autumn. To attain this end, manure should be applied not later than December. It then has time to get thoroughly into the soil, and is available for the young roots to draw on when starting into spring growth; at the same time, strong manure should not come in direct contact with the roots, but filter to them through the natural soil.

Here we must add a word of caution to those who have the opportunity of using a *large quantity of manure* when starting a plantation. Having been frequently called in to see trees which had started exceedingly well, and then collapsed, we traced the failure entirely to the *too free use of stimulants*, which, acting on the roots, forced the tree into an over

luxuriant growth, and such wood had become frozen, being unripe when winter sets in (especially Plums and certain sorts of Apples), and bough after bough has died off, and canker induced.

This is only too apparent when a severe October frost follows a wet "growing" summer. Plum plantations after being attacked by caterpillar, make a late autumnal growth, which suffers severely. In Apples the same thing takes place, mildew also sets in, and following the leaf-stalk to the eyes of the shoots, forms canker, which eats into the boughs, and in a few years changes a thriving plantation into a miserable lot of cripples which cannot recover. The better plan is first to see how trees succeed *without manure*, which, on a moderately rich soil or old pasture, they may do for years, such growth will be well matured and able to resist our inclement winters, unripened wood being the cause of so many trees missing a crop. Even if they blossom in profusion the vital organs of the flowers are not in a perfect state; and especially with Plums, some years may elapse before the trees become fertile. When a plantation shows signs of weakness in the pale colour of its foliage, or the stunted growth of the season, apply a liberal dressing; but even then, except in plantations where a top and bottom crop is gathered, do not use too strong manure. Where Apple or Pear trees carry heavy crops it may be put on the surface in June or July, and the rain will carry it to the roots and perfect the crop, besides assisting the tree to fruit the next season.

STRAWBERRIES.—Immediately the fruit is gathered, the space between the rows must be horse hoed or ploughed, to prevent the runners from striking. If

they are plentiful, it will be necessary to remove them with a small sickle; remove also any old or decayed foliage, the object being to develop strong young leaves. If it is convenient, manure may then be got on, but it is better placed in September or October, or in fact any time up till March. If the soil is wet, the rows are struck between with the plough, leaving an open furrow, which raises the crowns safely out of the risk of frost or water-logging. Established Strawberries should be kept clear of weeds, and be hoed once before they come to bloom; and if they cannot be conveniently horse hoed, hand hoeing will answer the purpose equally well. They should be mulched early in May with short barley straw, *i.e.*, supposing they have not been mulched with long manure in spring; if that has been done, the virtue will have washed in, and the straw remaining on the surface will keep the fruit clean.

GOOSEBERRIES AND CURRANTS.—These should be manured as soon as the trees are winter pruned, and where good well made dung is not available, artificial manures are valuable, changing the kinds used year by year. Fish guano may be used, as well as the stimulants before named. Some growers even mulch the bushes with stable dung after the first picking of green berries. This improves the quality of later green pickings, and gives greater size to the ripe berries.

CHAPTER III.

SETTING OUT AND PLANTING.—PRACTICAL HINTS ON PLANTING, ETC.

The following four half-acre plans, will show at a glance the best methods of "setting out," so arranged that pony or horse-hoes can be used the greatest length to save hand labour in hoeing.

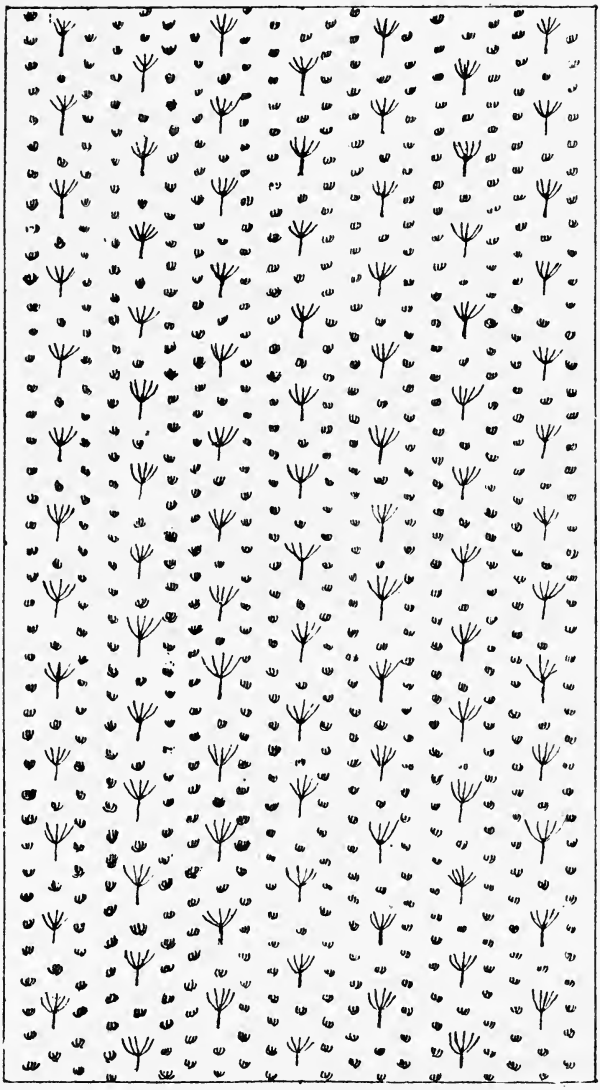
No. 1 is a plantation of "top" standard or half-standard trees with Currants or Gooseberries beneath at 5 feet apart; on rich land it would be better to place them 6 feet apart.

No. 2 is a Cherry orchard, which, to produce an early return, is usually "middled" with Plums or the weaker growing Apples; generally, by the time the Cherries are sufficiently grown, the supplementary trees have paid their way, and may be removed with advantage—leaving the entire orchard in Cherries.

No. 3 is the most profitable form of plantation. The bush or pyramid trees being on the paradise stock for Apples, or on quince for Pears—with Gooseberries or Currants between—the latter to be ultimately removed when the bush trees require the room. A growth of this description must be wired all round the hedges and gates, to keep out hares and rabbits.

No. 4 is a typical home orchard, for the supply of a family.

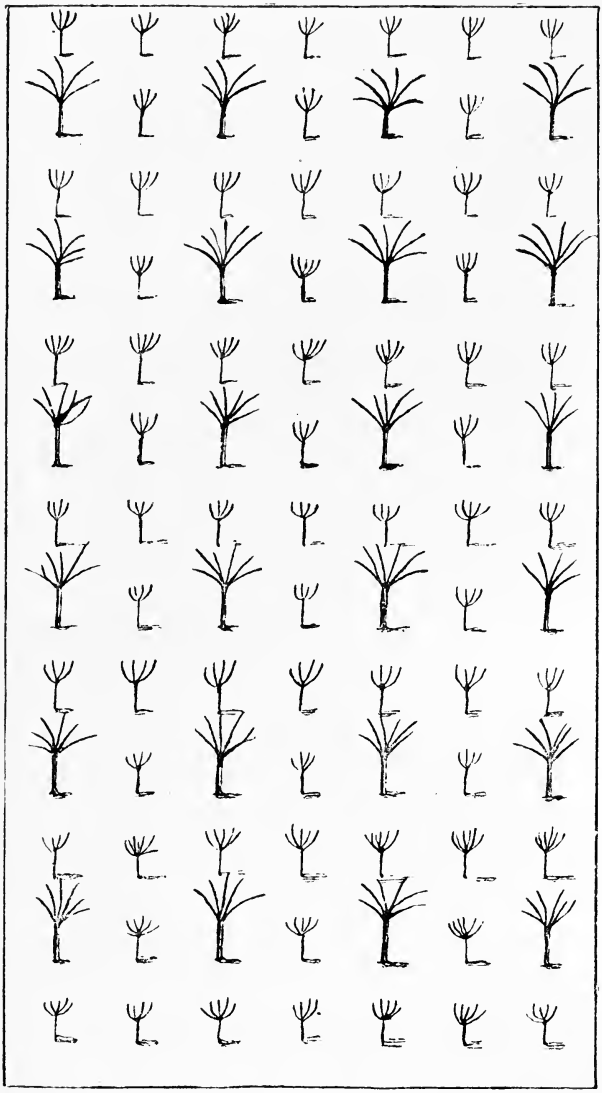
PLAN No. 1.



PLANTATION.—Standards or Half-Standards at 15ft.; Bushes at 5ft. apart.

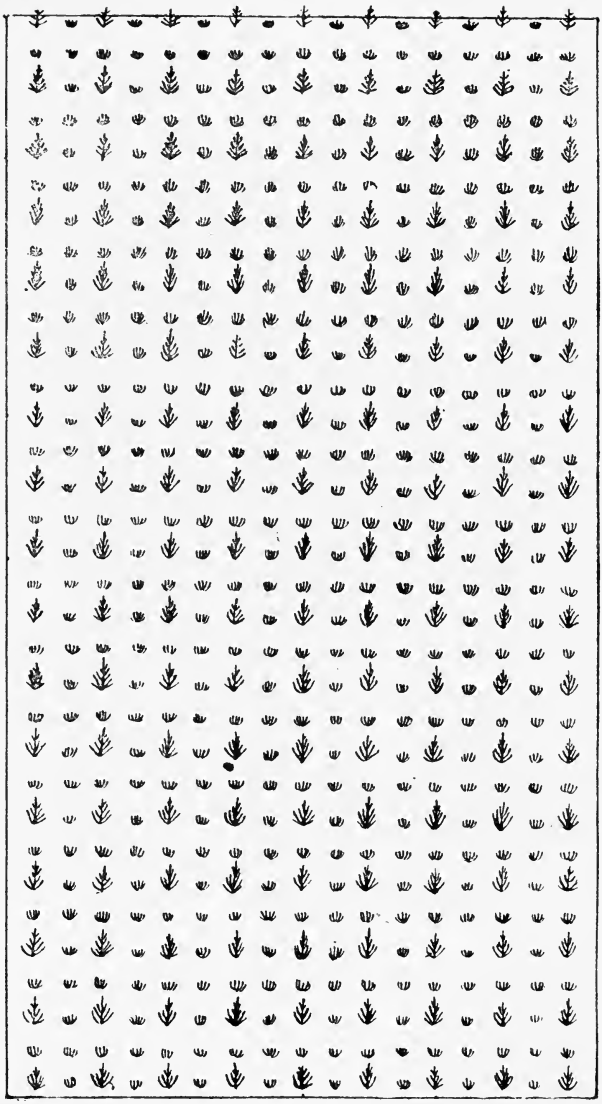
193 Trees and about 1300 Bushes per acre.

PLAN No. 2.



ORCHARD.
Cherries 30ft. apart, with Plums or Apples between.
48 Cherries and 134 Plums per acre.

PLAN No. 3.

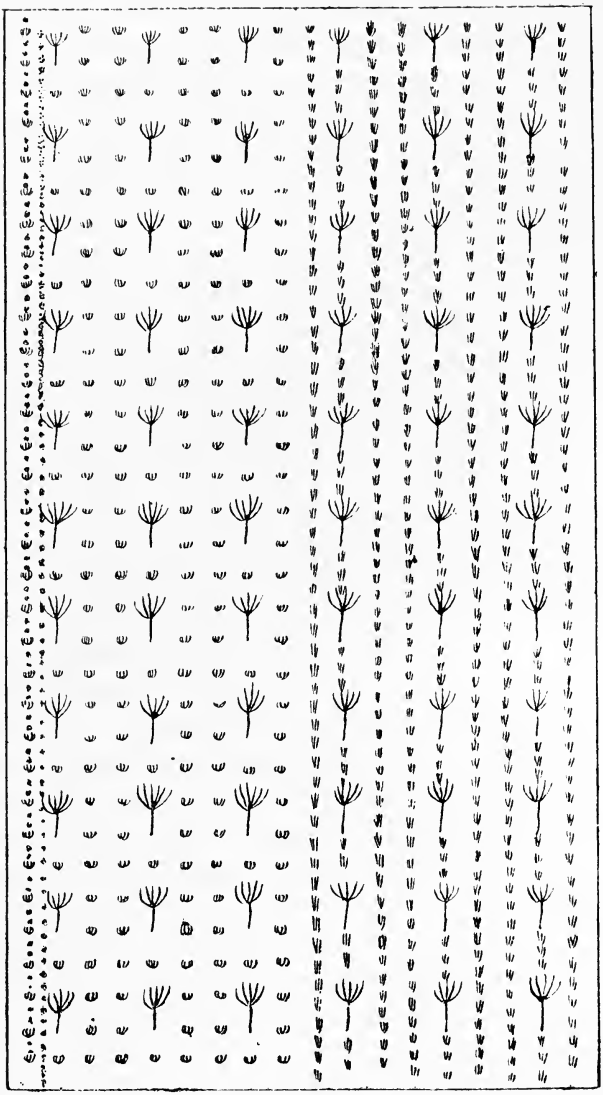


PLANTATION.

Pyramid or Bush Apples 12ft. apart, with Soft Fruit at 6ft.

300 Bush Trees and 820 Currants, etc., per acre.

PLAN No. 4.



HOME PLANTATION.—Standard Apples or Plums 18ft., with Bushes, or Raspberries and Strawberries between.

132 Standard Trees and about 200 Gooseberries, 2000 Strawberries, and 500 Raspberries per acre.

Care of Trees received in frost.—Should any trees ordered come to hand during frost or snow, they may (without unpacking) be placed in a warm cellar or frost-proof house till the return of suitable weather for planting, and will then take no harm. Trees should not be allowed to have their roots dried by the wind or sun during the planting. In planting, the small fibres should be well spread out, and the coarse roots be slightly shortened with a sharp knife, and any roots injured in lifting should be cut away, by holding the root in the left hand, and making a clean cut from the underside. In rich soil, no manure need be put in contact with the roots at planting time, but a thin mulching on the surface (about 3-ft. circle round the stem) will be very beneficial if applied at planting time or in the spring. The root fibres should be well enveloped in fine soil, and the tree be staked at once for standard orchard trees. The soil should be made quite firm in planting, but the surface should be of loose soil. Two upright stakes are preferable to a single one, or three may be placed at an angle. These stakes should be of ash, chestnut, oak, or bamboo. Never plant trees deeply, it is safer to err at the other extreme. If the soil is wet, plant on the surface, and make a mound over the roots of the tree. Should the soil be poor, some well decayed manure should be mixed with it at planting time.

To save expense, fruit trees are frequently planted in holes, which of course is the only plan on grass, but the cultivator would be amply repaid by having all land intended for plantations either steam cultivated or trenched. In the case of holes dug in a wet soil, they become so many traps for the water; and if the

soil is not particularly good the roots do not penetrate beyond the original hole, and trees come to grief in a few years. On light lands dig out a round hole 3 feet over, and about 1½ to 2 feet deep, break up the bottom with a mattock, make a little mound in the centre of the hole, then place the tree upon this; if the roots then reach beyond the circle, a cut with the spade is made to receive them; the tree is then lifted out and the hole is then levelled to such a height that when the tree is replaced (the mark place where the stem has been on the ground level before) is four inches *below* the level, then throw some fine soil upon the roots; the tree should then be shaken up and down to settle the soil round the lower roots, the upper roots are then lifted by hand, again spread out, more soil is added, the tree is again slightly shaken, and the collar mark allowed to remain two inches *above* the level, fine soil is shovelled in, this should then be trodden down firmly, beginning at the outside edge of the hole, and finishing in the centre, using great care not to bruise the roots. The hole is then neatly filled in, and the collar will generally be found a little above the level, but after the winter settling this will not be noticed. These remarks refer to standard, half-standard, and bush or pyramidal trees. In a few years this original hole may be extended by digging round it, to assist the trees to make fresh roots if they do not grow satisfactorily. For Currants and other bush fruit so much care is not required, but in no case should the roots be deeply buried.

There are three ways of applying manure when planting, two being wrong. The first and worst

method is to place it at the bottom of the hole. This starts the trees into growth for a short time, but as soon as the roots are through the layer of manure and strike the subsoil, unhealthiness is bound to set in. The second wrong way is to put too thick a surface layer round the tree stem after planting. As rains come, the action of water filtering through manure, renders the land hard and unkindly, and if left so it will in time become so caked as to throw off the summer rains, leaving the young tree to perish of drought. The right way is to almost finish planting without manure, leaving the hole wanting three inches of soil to raise it to proper height; then apply two inches of well-rotted farmyard manure, covering this with one inch of soil. In this way nutriment is given gradually to the roots; the natural moisture in the soil is sufficient to allow the roots to benefit by it, even in dry weather; and instead of making the surface hard and cakey, it renders it beautifully friable, and will materially assist working the hoes to keep down weeds in the following summer.

Bearing in mind that the surface fibres are those that nourish fruit, it is advisable that these be encouraged. The chief mischief accruing to young trees arises from too deep planting, and striking of the larger roots into a badly drained or unsuitable subsoil, causing canker, and apparently healthy trees may die back wholesale. In a mild winter the sap scarcely leaves the tree, when the branches being charged with moisture, a severe and sudden frost ruptures the cellular tissue, and perhaps the damage is not seen until some months after, when the points of the shoots die back, and even main branches split; such trees

then make a mass of small shoots from the main branches, which should be thinned out in August, or the result will be more disastrous. It is hoped that we may not often experience a zero winter's temperature. It is not surprising that under such circumstances fruit trees should suffer, when Poplars, Hazel, Elms, and Chestnuts are crippled.

MARKET TREES REQUIRED PER ACRE.

1210	at	6-ft.	apart,	for Pyramid Pears on Quince stocks, or Apples on Paradise stocks (where the trees are to be thinned to 12-ft. in a few years).
1742	,,	5-ft.	,,	,, Lancashire Lad Gooseberries.
1210	,,	6-ft.	,,	,, Gooseberries and Red Currants.
680	,,	8-ft.	,,	,, Black Currants. Some growers now plant on the six years' system—6-ft. between the rows and 3-ft. from tree to tree, destroying the trees if they take the "Big-bud" or become unfruitful.
302	,,	12-ft.	,,	,, Permanent Bush or Pyramid Trees and Cob Nuts.
193	,,	15-ft.	,,	,, Standard Plums, Damsons, May Duke or Kentish Red Cherries.
132	,,	18-ft.	,,	,, ditto.
108	,,	20-ft.	,,	,, Apples, Pears, etc., as Standards.
75	,,	24-ft.	,,	,, ditto, or the moderate growing Cherries.
48	,,	30-ft.	,,	,, Strong growing Cherries, where pastured underneath.
36	,,	40-ft.	,,	,, Strong Cherries, or the largest spreading Apples.

Strawberries for market require (about) at 1-ft. 43,000, 1½-ft. 19,350, 2-ft. 11,000 per acre. In the foot planting the alternate plants are ploughed up the second and third year, leaving the plantation 2-ft. apart each way.

In forming Orchards, the several distances that trees are planted will be found in the foregoing table. Orchards are best in square fields, as long narrow plots of Cherries are difficult to tend to keep off birds. If Cherries are selected, the distance being great, the intermediate space may be filled either with the early fruiting Apples and Pears of moderate or upright growth, or Plums and Damsons, which can be removed when the Cherries require the space. Cherries are best on grass land. The same remark as to distance holds good as regards the larger growing Apples and Pears; and there is one matter to which particular attention is called, viz., the very different rate at which trees progress. Unless this is borne in mind at planting, some parts of the orchard will be over-crowded, and others will be too thin. If an entire Apple or Pear orchard is required, the rows should be alternated. Some are widely spreading trees, others take a conical form: thus, if a row of a kind be planted, the orchard presents that even and regular appearance which allows the sun full play. To assist planters, the growth of each kind is stated in the lists of varieties. Experience further teaches us that large blocks of one kind do not fruit freely, because cross fertilization with another kind is absolutely essential to fertility.

Strawberries are planted with a dibble, a flat one being preferable; they must be well closed at the base of the roots, or they are liable to be lifted by frost. March is considered the best month to do the work, but the plants must be ordered, as most growers clean off their Strawberry lands and kill all the young plants as soon as the fruit is gathered, and they may

not have plants left in March. The land used for these must be cleaned, and heavily manured previously. Care should in all cases be taken to plant the lines straight, as it facilitates horse work.

Avoid contract planting, of which the following is a sample:—We had to take in hand an orchard in East Kent that had failed, and on removing the dead trees we found that in order to make a sightly job, the planter had sunk the tall trees deeply in the ground to *make the heads come level*; he literally dug graves for them. The trees were a bad lot to start with, being all heights and sizes.—Contract for holeing if you wish, fixing the area and depth they are to be made. As regards the time for planting: for all fruits November is undoubtedly the best month, as there is yet a little sap in the trees, which, on returning to the roots, assists in giving the tree a start, and helps to heal root wounds from lifting, the tree is thus placed in the best possible position for success. On the other hand, planting may be done all through the winter in open weather, starting in November, and as late as March, the main point being to secure the ground in good working order; and if much planting is to be done, valuable time will be saved by having stakes, yarns, hay bands, etc., ready for use. Soft fruits (Currants, Gooseberries, etc.), may even be planted the end of October, and it is surprising what roots these make before Christmas if they can be settled thus early. For further particulars see Chapter IV.

CHAPTER IV.

PRUNING IN COMMERCIAL FRUIT CULTURE.

A Paper read at the Rochester Farmers' Club by Mr. George Bunyard, V.M.H. (revised).

The Object of Pruning.—This operation is designed to assist nature in the production of superior fruit; which, by reducing the quantity of fruiting spurs and excess branches, enables the tree to concentrate its vital energy on a fewer number of buds, to their better individual development. Further than this, a skilful pruner leaves all fruit buds in the best possible position to catch the sun and air, with a view of obtaining not only increased size in the fruit, but to ensure that high colour and perfect ripeness which such exposure alone can produce. All growers know that fruit from the inside of a tree is not so highly developed or coloured as that from the outside. Thus a careful man will operate with a view to create a natural balance between roots and branch, so that each tree may produce a yearly crop, and not, as when left unpruned, a heavy crop in one year and none the next, because the tree requires a year's rest to recover itself. A story is told that the owner of a small garden had two standard apples that produced a heavy crop every other year, and my grandfather advised him to cut off the blossom from one at flowering time, after which he had a crop every year. The exhaustion of a tree

by an overcrop is emphasized by the fact that most early fruits (whether Apples, Pears, or Plums) are as a rule more regular bearers than later kinds, because the tree has time to recover its lost power between the gathering of the crop and the fall of the leaf, when nature's repose comes on. Evidently, therefore, it is on these lines that *rational pruning* should be done.

In dealing with this subject from a grower's point of view, we are naturally at once met with the cost of the operation, and it is here that we are at a disadvantage compared with the cheap labour of the Continent; but I would suggest that growers should teach their sons to look after this most interesting operation, and I am sure they would enjoy it, as I did looking after our orchard some years ago. The next point is:—*How to go to work.* I can remind you that, in dealing with some fruits, growers are already on the right track as cultivators, but I want to see the system extended. Take, for example, your Red Currants and Gooseberries after pruining; a novice would at once say you had ruined them entirely, whereas you know by experience that your berries are twice as large as when the trees are unpruned, and your Currants, too, are larger in the berry and longer in the bunch, while, in some cases, you summer-prune as well, to let in the sun to ripen the wood. If this pays in the case of the small soft fruits, it will also pay in the case of the harder "top" fruit; and you all know too well that it is the best samples from reputed growers which command the highest price; under-sized fruits and spotted samples really bring down the value of an entire crop. In a warm summer

on trees or bushes thus treated, your fruit would be super-excellent; and in a wet or cold season, what you produced would be much larger and clearer in the skin than from neglected trees. Again, in the case of Raspberries, you cut off 2 to 4 feet of the canes, certainly to save staking on the one hand, but also because you get much larger cones, and jam makers do not like Raspberries that are all seeds, as they must be if left uncut. In neglected gardens, Gooseberries are not one-fourth the size of those from properly pruned plantations. The most forcible example is that of the Cob Nut as pruned in Kent. The tree appears a miserable object after the cutter has done his work, but as the result proves, a better crop and far larger nuts are produced than on trees not pruned; in fact, if allowed to grow as they like the nuts are but a trifle larger than those called Barcelona in the shops.

Again, why is wall fruit so much finer than that from the open? Because such trees must be pruned to keep them in position, and moreover, the spurs are always (in properly cared-for gardens) thinned out and naturally all face one way to catch the sun, and have the additional benefit of the radiation of heat from the wall to assist in the ripening of the wood.

Having given you, perhaps, too much theory, I will now proceed to indicate how I would recommend the pruning to be done on young trees, say *standard and half-standard* Pears and Apples. In planting, all that is necessary is to cut off any injured roots, and then to shorten back slightly the lower anchor-like roots, taking care to cut in closely the tap root, as well as those that have a distinctly downward tendency, always cutting from the under side. Pears have fewer roots

than Apples, and must not be cut so severely. The tree should then have its head examined, the planter holding it so that he can, as it were, look it in the face on a line with the trunk. He will then see at a glance if there are more shoots than are required to form a symmetrical head, by preference he retains 3, 5, or 7 shoots, placed at equal distances, like the spokes of a wheel. I mean if we get seven, so much the better, but it is, for the purpose of foundation, preferable to have even three at a regular distance between each other, than to have four or five, the balance of which is uneven. All surplus shoots must be cut clean away, and the rest should not be cut or tipped. *After a summer's growth* (in February by preference, avoiding frosty weather), this head is to be cut back rather severely, leaving, say five or six eyes at the base, but cutting so that the end bud is left pointing outwards at the extremity. From this cutting several shoots will issue, and in July the pruner should go over his trees and cut back (leaving only one inch of wood) those that are in the middle of the tree, preserving at their full length all those that form a head like an inverted umbrella. The following February these are again shortened; but this time allow about six inches of the new wood, and continue the operation for a few years, leaving 9 to 12 inches for extension; the trees will begin to bear on the old wood in the third year. Keep the centre of the trees thinned out winter and summer, and do not allow too many shoots to encumber the tree, but prune so that all main branches hang free and do not cross each other. Possibly, in a few more years, some branches may be cut away with advantage, as there will be

stronger ones taking the lead, which, provided they are in proper places, may be allowed to go ahead. I consider this severe pruning necessary at first, because some Apples and Pears, if left uncut, form a mass of fruit buds, come into bearing, and never afterwards get beyond a mop-sized head. Some plums have the same tendency.

Siding.—Feathered trees and young half-standards are greatly assisted in strength and vigour, if some of the side shoots on the main stem are left on for a few years.

Caution.—A word against the treatment generally meted out to young trees, both bush fruits and standards, in the matter of pruning. Given a tree of say two or three years' growth that has made a good start in life, your average cutter will prune it just the same, that is to say he will cut rather more than half the current year's shoots away for the first three or four years of its existence. In this way the tree is certainly kept healthy, but it practically does nothing more than make wood, and far too much of that, so year by year the cutter has more superflous wood to take out, and this treatment forces the tree to make renewed efforts at wood growing. If the young tree, instead of being cut so hard—(the hard cutting is necessary for two years, but no longer)—is allowed to carry a much greater length of its year's growth, say two-thirds in place of a quarter, it will at once commence forming bloom-buds, and the year following will probably bear a little fruit. At the same time, if treated well in the matter of manure, it will also make plenty of new growth to continue building up the foundation of a good tree. The foregoing is what

one might describe as advice for general treatment, but it must be remembered that no two varieties of fruit have quite similar habits, and the grower must exercise discretion to a great extent in their management. For instance, Apples like Lane's Prince Albert, Stirling Castle, etc., are such prolific croppers that unless they are heavily pruned every year they make no new wood growth. On the other hand Bramley's, Newton Wonder, etc., make such vigorous shoots that it is best, as soon as a tree has shaped out a little, to cease cutting it altogether, merely regulating the growth by removing superflous branches. The pruner must himself learn to distinguish between sorts and the treatment they require, for it is just the care bestowed in matters of this kind that makes for success.

With *Plums* (from the nature of their roots) if planting is completed before Christmas, they may be pruned the first season of planting, but if planted after that time it is better to allow them to wait one year. Their after attention is the same as that advised for Pears and Apples, but as they grow more freely, they need not be cut back so severely, as they form a head rapidly.

In planting *Cherries*, I strongly advise planters to let them stand the first year without cutting at all, excepting the roots, as advised for apples. In the following February cut the heads back as required, after which, the less "knifing" done on them the better, merely removing the crossing boughs.

The management of *Bush or Feathered Trees* on the Crab stock will be the same as advised for standards, having regard to the form of tree desired, but as they

are more protected from the wind, and the crop can be thinned, they may in pruning carry longer shoots than standards. Apples upon the Paradise stock may be cut back the first season if planted early. In all cases prune the roots as advised on the previous pages. Much controversy has arisen as to the wisdom of pruning or not, the first year of planting, but I am convinced that the system here advocated is the best for orchard and plantation work, where every tree cannot have that special attention which can be given in a garden.

In *Soft Fruits*, the prevailing custom of cutting them hard the first year cannot be improved upon; but in case of late planting (say February or March) the resulting shoots are so thin and sappy that it may be best to let them stand a year to establish themselves before pruning. It is most desirable that they should be planted before December, as in that case the rootlets push and get a firm hold of the soil before winter sets in. In planting Raspberries for market, they must be shortened, before planting, to about 2 feet.

Old Trees.—I now come to a more important point in *pruning*, namely, that of old and neglected trees, which are far too prevalent, and where faggots must be taken out to make any impression on the mass of useless wood they contain. In dealing with such examples, one need be very careful, for it is well known that where large boughs are sawn off, the remaining end of the bough will sometimes rot away and decay, and in that case the tree suffers loss by heavy-laden boughs giving way at a weak spot. I am of opinion that it would be well not to cut these so

close to the main stems and branches as is usually done, but about 6 inches from the stem, and that after the saw has been used, the surface should be planed over and the edges be rounded and smoothed with a knife, so that new bark can creep over and cover the wound.

All *Old Orchards* have trees with holes in them – the favourite nesting places of the starling and tom-tit. The wood decays, and the woodpecker first starts the aperture by searching for its food, and other birds take the opportunity to nest where they can readily make room in the soft spongy wood. All shoots sawn off over half-an-inch across should be rounded in the way indicated, and I strongly recommend that this pruning should be *done as soon as the fruit is gathered*, as the bark then makes some progress to cover the wound the same season, and the air being dry, the exposed wound hardens (so to speak heals) more than in the winter; and moreover, the shoots that are dead and leafless can be detected much more readily than when the leaf falls. I must repeat that all this severe pruning should be done in the long days of summer or autumn. Especially should all broken and split boughs be removed from Plums where injured by ladders or an over-crop.

I have heard of trees being severely injured by being pruned in a heavy frost, when the men could not work on the land, but I cannot say that it is always so.

In pruning these "old stagers," it is not advisable to tip the branches, as the most lively wood, which draws the sap up freely, is on the points, and they nourish the tree.

The next point which I think worth a trial on a large scale is the thinning of fruit spurs on old trees. I submit a fruiting branch of the old Yorkshire Apple, the "Cockpit" (a free bearer, but too small for profit here). When these trees bear, I have half the fruit taken off, but although that makes the fruit finer I am now thinning the spurs so that they may be larger still, and I am persuaded that if half the spurs were taken from our old orchard trees, which is easy work with a tool like the one I am using (see page 46), we should get much finer fruit, and these spurs if cut about an inch from the stem, would in some cases throw out other spurs, which in time would enable us to prune out those left in the former cutting, and thus we should have perpetual youth on the head of an ancient body. Pears are most profuse in the way they spur, and some kinds bear so freely that they are not inaptly said to crop "like ropes of onions." In the case of Plums it is the same. The "Diamond" would bear more freely if half its spurs were taken out; and the "Victoria," under this treatment, would not be so liable to break as it does from carrying such heavy crops. "Jefferson" again is a mass of spurs; in fact, even in winter, an expert can tell the names of leafless trees by the form of the spurs, and the way they set on the branches.

In removing what I may term *surplus spurs*, those found on the *undersides* of the branches are of little value; and if I say, negatively, that the pruner should retain all spurs in the best positions, and remove the rest, you will get an idea how to work. The Crittenden or Cluster Damson is one which makes a mass of thorny spurs; these require thinning, as, if left too

thickly on the boughs, the fruit is very small, and you will have noticed that trees from suckers are much more inclined to thorn than those budded, which take more of the Plum nature, and they are much more liable to Aphis blight when the heads are crowded. The King Pippin and Manx Codlin Apples, for example, are very fruitful trees, and I know that those who prune them on the spur system, and shorten all the young growths, defy the inevitable canker which affects these sorts. These closely pruned trees grow marvellous fruit, which sells at a price that pays for extra labour expended.

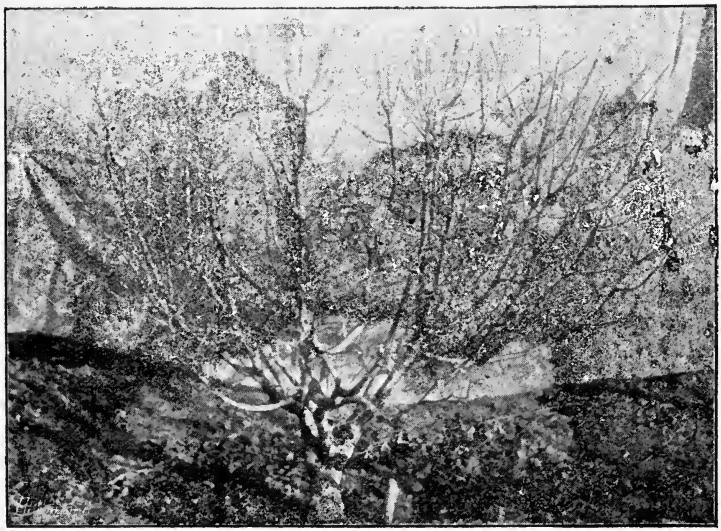
I can scarcely leave the subject of pruning without reference to the *Kentish Cob Nut*, which requires more pruning than any other fruit. Our Kent men use Saynor's Sheath Knives, No. 185, for this work.

When received from the growers, Cob trees have a small head upon a stem of 12 to 15 inches, this stem is intentional, so that the ground beneath the bush may be the more readily kept free from weeds and be dug. They are planted as received, and must be allowed to grow for one year, when they should be cut hard in, to make them throw out vigorous shoots from the base of the head to form the future tree; this is done by annually cutting, so that the next terminal shoot is made from an under bud, which in course of time makes a tree formed like a washing basin. I note the best shaped trees have started with six to be doubled to twelve main branches, from these a set of spurs or shoots are given off, on which the nuts are produced, and the trees should be so managed, that at the end of 100 years old they should be 15 or 20 feet across the top, but not higher than $5\frac{1}{2}$ feet

from the ground. From the central portion of the main boughs a number of strong yearling shoots will be given off, which in Kent are called "wands." These are taken out in September, or partially so, for packing the autumn fruit, and in winter the rest are broken out, and either sold for flower sticks or basket making, or reserved to pack soft fruit the next season. The male or catkin blossoms are produced in February and March most freely at the upper part of the trees, and should be allowed to remain long enough before pruning to fertilize the minute red pistillate or female flowers, which are produced on the smaller boughs; should the weather be very still and warm it would pay to tap the boughs with a stick, to make the pollen fly. In the winter pruning, the spurs are thinned; old wood is removed and the stronger growths shortened and thinned, leaving the trees regularly balanced on all sides, and with free play for the air and sun among the branches, remembering that the foliage is large on pruned trees. If time permits in July and August, it is a great help to the strength of the tree to break the stronger shoots off the upper boughs with the finger and thumb (a sharp twist being all that is required), this plumps up the buds below the fracture, assists in ripening up the wood; this is found better than cutting, as the broken surface allows some sap to exude, which prevents the formation of a secondary growth, which would weaken the bush and be of no value to produce nuts. In winter pruning these broken ends are smoothly severed with a sharp knife. A careful pruner will proceed so that there is always abundance of fresh young wood in his Cobs, and when a twig shows signs of age, he

prunes so that a fresh young one shall succeed it in the next year's cutting, so that worn out twigs are never seen in ancient trees. Suckers from the roots should be hoed off in growth or in winter be severed with a sharp spade, and if well rooted some may be reserved to make future plants.

Some fair nuts are produced on trees 10 to 12 feet high, which have their spurs shortened in the same way as Espalier Apples, gaining a few inches of upward extension yearly at the top. It is worth consideration whether existing copses and covers could not advantageously be planted with these Nuts. The trees over head need not be removed; as in Kent, Apples, Pears and Plums frequently form a dense cover over Cob Nuts, and yet they produce, but naturally not so freely as those in more open quarters. A Photograph of a Kent Cob Nut 8 years old, summer and winter



Winter aspect of Cob Nut before Pruning.

pruned, will give an idea of form, etc. In this example the longer top shoots will require pruning back to four eyes, and the side spray on the branches should be thinned where too thickly placed.

Further information bearing on these subjects is given under the heading of planting, and in the chapters on the several fruits. For digging, Parkes' 4 and 5 prong cast-steel forks for light land, and spuds of 3 prongs for heavy work, are used; the latter, as sold by ironmongers, are not well made, the local blacksmiths generally turn them out stronger.

In Continental works on fruit culture much stress is laid on the tools used, and I have brought up a few which we find useful as labour-savers, and they are so simple that they explain themselves.

1. Coppin's tree pruner, avoiding the use of ladders in young trees; made from 6 to 10 feet long.—*(See advertisement).*

2. American lightning saw, with teeth on both sides, very easy and rapid in its work; capital for green wood.

3. Aubert's secateurs.—*See illustration.* The best make. No springs to get out of order.

4. Samples of Saynor's clasp knives, Nos. 189, 190, and sheath knives, 185.

RED CURRANTS are greatly improved by summer pruning in August, shortening the small inner shoots, and leaving two or three the full length at the end of each bough to take away the sap. They then form a mass of fruit buds, and the fruit hangs as thickly as possible. The winter pruning here being merely to shorten the long shoots (left from the summer) to three

or four inches, or less if the tree has gained its full size, care being taken to get the boughs well above the ground to prevent the fruit being spoiled by the soil washed in the rains.

BLACK CURRANTS require to be heavily pruned, and the work should be so arranged that old wood is cut away every year, as, if allowed to grow tall, the crop being mostly on the points of the shoots, causes the branches to break off, whereas if the trees are kept low in the way indicated, there is always young wood, and the only care required is to thin this out, removing weakly and ill-placed shoots, retaining the strongest and best—those with prominent buds. Black Currants are best cut back to four eyes the first year of planting, and Red Currants the same.

GOOSEBERRIES should be pruned hard for a year or two. If allowed to bear too freely when young, the bushes become stunted and checked, and do not recover for a time. If planted early, they may be cut back before planting, and are then easier to set. The object in pruning Gooseberries is to raise the main branches off the ground, otherwise the fruit gets dirty, and to cut in such a way that the tree forms some stout young wood every year; preference being given to those shoots that stand up with an outward bend. The fruit of recently planted trees would be better gathered green the first year, as the tree has then a chance to recover itself the same season. Gooseberries are usually grown on a leg (a stem of 6 to 8 inches), as the land can be more readily cleaned, and it keeps the fruit from the soil, but some planters prefer them without a leg, as there is then a chance of re-making a tree if branches are broken off; especially the Lancashire Lad variety.

RASPBERRIES are generally too little pruned; the forests of cane which the best grounds produce would pay for thinning as soon as the crop is gathered; and at the same time the old canes that have fruited should be removed, to assist those that are to crop the following year, and in February or earlier, the canes should be shortened to about 4 feet long, according to the strength of the cane, the object being to leave as much as the cane can support without assistance, as they are not staked in fields. Some growers gather the shoots at the top with yarn, which prevents the canes bearing down under the weight of foliage and fruit, which may happen in showery weather. Where Raspberries are grown for sale in punnets, it pays to leave the canes longer, and arch them over, tying them in a continuous line. One grower states that by tipping back the points of the summer growth on young canes in August, he increased his crop to three tons per acre. The land should be cleaned as directed for Strawberries.

Early in August, Apple trees, especially those from five to ten years old, will pay well for attention. The Americans understand a good many of these matters quite as well as we do, and they always have their trees thinned out in August or *immediately after the fruit is picked;* this system is strongly advocated and practised in the Allington Nurseries of my firm. The correct plan is to thin out the superfluous central wood so as to admit all the light and air possible to ripen the main branches. If pruned too early in the year, the trees make a second shoot, which does harm. The month of August is the best time for this "summer pruning." It is immaterial whether the fruit

is picked or not, only it is an awkward job if the tree is heavily laden. Only those shoots should be cut away that would have to be removed in winter pruning, and the pruner should leave shoots with three or four leaves on the pruned shoots next the main branch. This makes a small spur that will in all probability throw one or two bloom buds in future. The leading shoots should be left their full length, but if very long they can have 1 to 1½ feet cut off their ends. Trees that are planted in hops benefit very much from this treatment. The shade of the hops, and generally too rank a growth, tend to develop an abundance of long sappy wood, which left to itself, cannot ripen sufficiently to withstand frost. If, after thinning, the remaining shoots look too weak and bending, it is a good plan to cut 9 inches off their ends in a fortnight's time, just before the hops are picked. This prevents them from being damaged by sudden exposure to the wind.

The most useful work on Pruning we know is Udale's (see literature page end of book). It is nicely illustrated and gives careful instructions.

Extract from "The Journal of the Royal Horticultural Society," March, 1910.

THE PHYSIOLOGY OF PRUNING, by my son, E. A. BUNYARD, F.R.H.S.

"To students in this case I would recommend a study of plant physiology or plant functions as the only sure basis upon which a knowledge of correct pruning can be founded. A short consideration of the vital processes of plants will, I think, demonstrate how much the pruner may learn from the physiologist. . . . Then follows a lucid explanation of the functions of sap, leaves and roots, and their elaboration—which are too long to include here.

We may now consider how this supply of sugar and starch in the sap is drawn upon for the nourishment of fresh growths. The most convenient example of this is the development of the bud. The buds are developed in the axils of the leaves, and an examination of a strong shoot in winter will reveal a certain difference between the buds situated on different parts of the shoot. The buds at the base will be seen to be very small, while those midway up the shoot are conspicuous and are covered with a downy felt. The latter are fruit buds. Higher up the shoot the buds again decrease in size, except perhaps the terminal bud of the shoot, which may be a fruit bud again. The shoot can therefore be divided into three dintinct parts: dormant buds at base, fruit buds at the centre, and above these the wood buds, viz., those which will produce only fresh branches and no fruit. It may be asked: What is the cause of the difference of these buds? It is entirely a question of development.

Given a sufficient food-supply all buds will develop into fruit buds, but a deficiency results in either dormant or growth buds only. Bearing in mind what has been said about the importance of light, it will be seen that this factor alone will account for the whole difference of the buds shown on the shoot. The dormant buds at the base were nourished by leaves which were to a certain extent shaded by those above and therefore not so capable of forming food-products. The leaves above these are the most favourably situated and are produced at a period of maximum sunshine (midsummer), and their activity is therefore the greatest. The leaves higher still are borne on the second or autumn growth, during which weather conditions are not so favourable and consequently only wood buds are produced. The leaves at the extreme end of the shoot are, however, in an excellent position and, moreover, are in a rosette, which results in many leaves supplying all their food to one bud, and the result is frequently a terminal fruit bud.

In varieties of great vigour and with a large leaf-surface the activity of one season is often sufficient to produce a fruit bud when it is very favourably placed. The formation of fruit buds and spurs in varieties of less vigour and of buds less well situated as to light and air is a matter of two seasons. Let us assume that the shoot above referred to is unpruned, and follow the development of the different buds the following season. The dormant buds at the base of the shoot will remain unaltered. The fruit buds will produce their blossoms and a supply of leaves which will feed the ensuing fruit. The wood buds above

these, however, may take one of two courses. If the supply of sap be plentiful they will develop into moderate shoots. If, on the other hand, the supply be inadequate, each bud will produce a rosette of five leaves which will nourish a fruit bud in their midst exactly as did the terminal bud of last season, and this bud will of course produce fruit the next season.

If pruning is done in the winter, the results of cutting to the different buds will naturally vary greatly. When the shoot is cut down to the dormant buds at the base the result is that the roots being capable of supplying the entire shoot with sap will concentrate on one or two buds the amount intended for the whole shoot. These buds, thus stimulated, will commence a very strong growth, and this is of course the reason that hard pruning encourages strong growth.

If the branch is cut down to a fruit bud the result will be that these will develop into spurs, a development which we will briefly consider. A spur is a dwarf branch. If we imagine that the spaces between the leaves on a normal shoot were elastic and that it were possible to extend or close the shoot like a telescope, we shall see how this applies. When extended on the branch, the leaves are, let us say, one inch apart. When we push in the branch the leaves will naturally be quite close together and have an appearance exactly similar to that of a spur, the terminal fruit bud having its rosette of leaves. The spur is then an unextended branch, and the rugged appearance of its bark is merely due to the leaf scars being quite close together. Each of these leaves will produce in their axils a small bud which will, according to circumstances, remain dormant, or in time develop

into another spur exactly as on the extended branch considered above.

We may now briefly refer to the case of the shoot should the tree be moved. This means in effect that the roots will be damaged, that new roots will have to be made from the foodstuffs stored in the stem and coarse roots. But this is a slow process, and until the old root system is entirely replaced it means that the branches will have to go short of their usual supply of sap. The effect upon them will be marked. No strong growth will be made, and even if cut back to the dormant bud a weak shoot only will result. If the branch is unpruned the shoots will put forth their flowers, but lacking sufficient sap, fruit will probably not set, and if it does there will be a lack of nourishment and consequently small, undersized fruit. The leaves will be small for the same reason, and the result will be that the supply of food material that is made—not being used up in the production of growth, will all be used in making fruit buds.

Thus we see how it is that root-pruning will throw a tree into fruit by allowing the elaborated (organic) sap to predominate over the crude (inorganic). This puts the whole question of fruitfulness into a nutshell. Predominance of root sap means growth; predominance of leaf sap, fruit.

This is illustrated in another way. It is often said that canker causes a tree to fruit. It is not, of course, the disease that causes this, but merely that the elaborated sap on its way to stems and roots is stopped by the damaged bark and held up in the branch. The buds therefore get an abnormal supply of food material which aids their development into

fruit buds. The ancient practice of bark-ringing is based on the same principle, as is also that of wassailing the apple trees. Readers of Philpotts' "Children of the Mist" will remember the "wassailing" of the Devonshire orchard described therein. The ceremony of discharging guns at the trees had no doubt the practical result of causing many wounds in which canker would establish itself and thus check the downward sap flow, and thus the fruitfulness which was believed to follow this ceremony would be capable of a simple explanation. Another well-known practice, that of bending down a branch to make it more fruitful, also owes its success to the fact that it would be more difficult for the elaborated sap to flow out of the branch into the stem and thence to the roots.

All fruit-growers will know how freely the middle portion of a fan-trained tree will grow compared with the side branches which are parallel to the ground. This is due to the fact that the straighter the passage the quicker the flow of sap. The centre branches take more than their share of root sap, and the freedom with which the elaborated product flows back to the root prevents those strong branches attaining the fruitfulness of those situated at the sides.

Other examples might be given, but enough has been said to illustrate the point and to show how a knowledge of physiology may be of value to the pruner. It is manifestly impossible in the short space of a lecture to more than roughly sketch these possibilities.

In the different conditions in which the pruner finds his subjects, in their varying constitutions and habits,

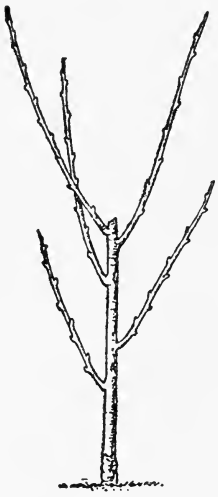
it is evident that mere dogmatic rules for pruning cannot suffice. A knowledge of the principles of plant growth will place him on a sure foundation from whence he can estimate the value of rules and their exceptions, and will lead him to approach his work in the spirit which is expressed in the motto of our sister Society, 'Practice with Science!'"

Before concluding this chapter, we would give a general invitation to all contemplating Fruit culture to visit our Allington Nurseries, to see the various modes of fancy training and pruning; such practical examples will be found most useful to Amateurs, who are often rather confused by technical terms which are new to them, and much can be learnt in a few hours. The months of August and September are the best for such a visit—for routes consult G. B. & Co.'s Fruit Catalogue.

CHAPTER V.

APPLES.

In Kent, where hops are grown, the oasthouses afford capital places for storing Apples, being airy, dark, and cool. It is common for Apples in these stores to keep three months after their usual season; but the Market Fruit Farmer may not have such conveniences at hand, we therefore divide our notice of this valuable fruit into two divisions—first, Apples that can be marketed direct from the tree, and secondly, those that pay for storing. The former method has many advantages, and on the whole pays best. The bruising in gathering and storing, the loss by rotten fruit, and the double operation of picking and packing is perhaps rarely recouped by the higher price obtained for stored Apples. Where Apples are stored, the straw used to protect the fruit from frost being clean, can be utilized elsewhere afterwards.



BUSH APPLE, 2 years old, on Paradise Stock.

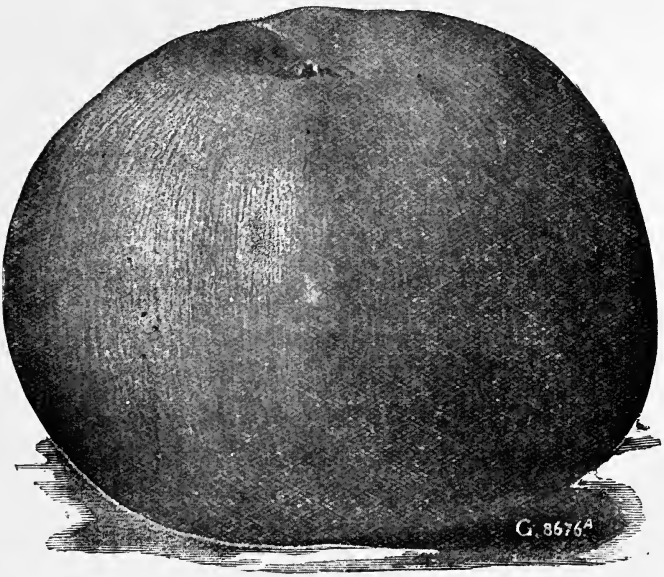
EARLY DESSERT APPLES, to sell direct from the tree, in their order of ripening :—

1. Beauty of Bath—Very early, a free cropper, which sells at a good price. A moderate grower. Fruit flat, with bright scarlet colour, speckled white. Mid-July.

2. Mr. Gladstone—very fine, good regular bearer, of rather pendulous medium growth. Fruit with a bright crimson-scarlet skin, rich aroma. Should be sent to market before the fruits are fully ripe, or it bruises in transit, and then only realises a small price. July—August.

3. Lady Sudeley—A grand September fruit, of brilliant colour, rich aroma, growth spreading, fruiting at the points—a splendid variety which succeeds well both North and South; sells best in boxes. Trees pay for spur pruning, when they bear freely all over the head.

4. Worcester Pearmain—Of upright growth, a free cropper, fruit of medium size, conical, very handsome, with a bright crimson cheek. This has become the best paying Autumn Apple, and is a great favourite in the markets. September.



No. 6.—Ben's Red.

5. James Grieve—Growth free, but compact; an early seedling from Cox's Orange raised at Edinboro'. A regular bearer, fruit handsome; sells well, as it comes for use when Dessert Apples are scarce. September—early October.

6. Ben's Red *(see illustration)*—Growth short-jointed and compact—may be called a late Quarrenden—but a sure bearer and altogether more reliable; selling very freely in the market; fruit bronzy-red-flat. September and October.

7. Ingestre, or Summer Golden Pippin—Tree pendulous, and on that account most suitable for plantations; a great cropper, soon coming into bearing, fruit small, clear primrose yellow, a favourite "costers" Apple, generally brings many shillings more per bushel than others; fine on dwarf Paradise trees. End September.

8. Duchess Favourite—Forms a close upright tree; fruit small, brilliant scarlet, a valuable fruit to market before King of Pippins; sells freely. Early September.

CULINARY APPLES, to sell direct from the trees:—

9. White Transparent—Growth upright, free. The earliest kitchen Apple, fruit medium sized, pale cream colour, of taking appearance, a very free bearer which succeeds both near the sea and inland; good as a dwarf on Paradise. End July and August.

10. Early Victoria—Growth compact, an enormous bearer and the best early yellow Codlin. Grown extensively at Wisbech as Emneth's Early; fruit above medium size. August or early September.

11. Early Julian—Tree vigorous but not large, a tremendous cropper, fruit very pale and clear, one of the best early Kitchen Apples; on half-standards or dwarfs. August.

BUSH APPLE on Paradise Stock.—Three years unpruned. Though pretty to look at, such a tree is started badly, and the stock is exposed whereas it should be 3-in. underground.

12. Lord Grosvenor—Very compact grower, suited for plantation and orchard; fruit conical, whitish yellow, produced in bunches, so that it requires thinning; succeeds in lands where Lord Suffield fails. This Apple pays for high culture and comes to profit quicker than any. September.

13. Grenadier—A great improvement on Keswick Codlin, a free bearer, of upright growth, fruit flat and angular, greenish yellow, tree hardy and robust. Stores well, and grows to a large size on bushes. September.

14. Stirling Castle—This bears too freely to form a standard, but is valuable for a plantation. Fruit shining greenish yellow, of perfect globular shape, never fails to bear, and requires severe thinning; compact grower, can be planted 8-ft. apart. August—September.

15. Warner's King—a monster, bearing freely; tree vigorous and spreading, of very distinct growth, fruit flat oblate, smooth and clear, greenish yellow, requires warm soil. End September.

The whole of these Apples succeed as pyramids or bushes on the Paradise stock, and produce very freely. Such dwarf trees are worthy of extensive cultivation, the fruit comes particularly handsome; after the first few years the trees require but little pruning, all that is needed being to regulate their growth. When heavily cropped, mulch the trees freely the end of May with long fresh straw manure In planting these Apples upon the Paradise stock, it is important to get them upon the "broad-leaved Paradise," and to plant them so that the junction of stock and scion is 3-in. below the surface of the soil. They should be planted 12-ft. apart.

All Apples require thinning early in August, such thinnings will pay for the labour, while the crop left on the trees benefits greatly by this operation, and developes to greater perfection.

We now come to what may be termed the better class Apples, for storing, *i.e.*, those that will pay for such attention. In a scarce year many of these may also be marketed from the trees to advantage.

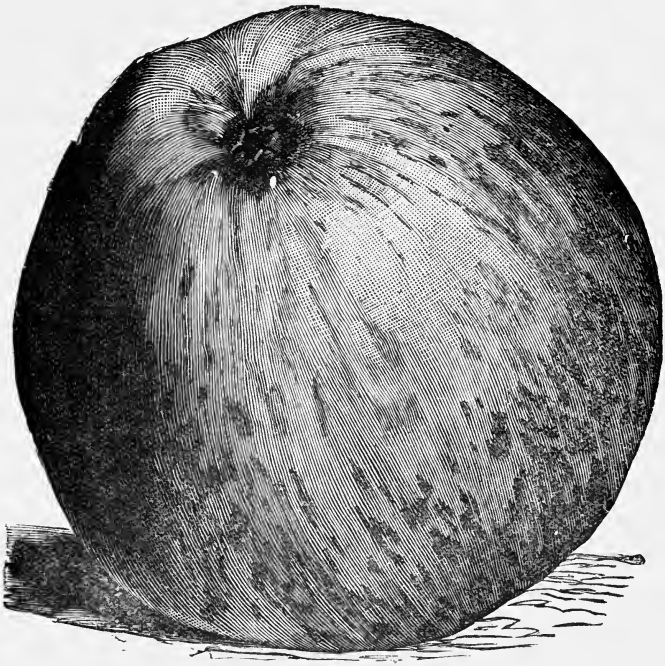
DESSERT APPLES that are recommended for storing, in their order of ripening :—

16. King Pippin—A great bearer, and a favourite in the markets. This requires storing till of a rich golden colour, and if the summer has been fine, it assumes a red cheek, which makes it very acceptable. Fruit small to medium. Although this close upright tree is very liable to canker, it bears freely, and is one of the best for warm, dry, stony soils. Early October.

17. Allington Pippin—Growth free and compact. This desirable Apple was introduced by my firm, and proves to be a sterling kind; the fruit closely resembles Cox's Orange, but is larger, cleaner, and handsomer in appearance, while the tree is a better bearer and more suited than Cox's for a Northern climate and cold districts; often first class in flavour, a splendid bearer in any form. November. (*See illustration*).

18. Cox's Orange—The finest dessert Apple. Prefers a warm situation, and then crops heavily, and the fruit takes a fine colour. It is a nice size for dessert, and having a Ribston flavour is much fancied. It does not succeed in cold damp places, although when fruited there it is superior in quality to those grown in lighter soil. Fruit with a bronzy red cheek, shaded

to yellow. It makes a nice small standard, and is at its best in plantations upon the Paradise stock. The larger fruits sell at a high price in boxes of 12 or 24. During the past cold seasons Cox's has failed in many places, and it is not advisable to plant any number until it is found the soil suits it. November—December.



No. 17.—Allington Pippin.

19. Blenheim Orange—Although mainly a culinary Apple, small sized fruits are very acceptable for table use, and frequently make long prices. The tree grows very widely, and requires room, and when old, assumes a pendulous habit, and then is a good bearer, but is slow in coming into fruit. November—January.

20. Gascoyne's Scarlet—Remarkable for its great beauty; after being laid up for a few days it turns yellow on shaded side, and its wonderful scarlet cheek gives it a striking appearance. It is sweet and agreeable, makes a large tree, and crops most profusely when the tree gains size. November.

21. Christmas Pearmain—Growth free, compact, and very short jointed; fruit yellow, russety, with bright colour, enormous bearer; introduced by my firm. A variety which can be grown where King Pippin fails; a nice size for market, travelling well. November—December.

22. Baumann's Reinette—A capital cropper, making a neat upright tree. Takes a crimson colour, and fruits in clusters; very handsome; keeps well till February; fine as a dwarf on Paradise. December.

Several Seedlings have been raised from Cox's Orange, such as Coronation, Charles Ross, the Houblon, St. Everard and William Crump. Their value for market is not yet appraised, but they may prove useful for Garden culture. Houblon and William Crump are most promising.

CULINARY APPLES FOR STORING, in their order of ripening:—

23. Peasgood's Nonsuch—A remarkably fine large fruit, of handsome appearance, cropping every other year, of free spreading growth, succeeding as a standard or on Paradise. Market as soon as well coloured, in boxes; apt to canker. Early October.

24. Lord Derby—This has become very popular; the tree grows upright and bears freely, annually; green when gathered, turning to a most beautiful yellow; good for cool soils. A local grower secured 3,000

bushels in the short year 1909, and marketed them from the tree direct at a good price; large prices have been made at orchard auctions. October—December.

25. Bismarck—Tree compact and pendulous. This never fails to crop heavily, and the large fruits sell equally well from the tree or stored. Best in a warm soil in the South; it does not colour well in the Midlands. November, keeping till January.

26. Norfolk Beauty—Growth free and branching, a valuable Apple, bearing freely in many parts, of splendid cooking quality, fruits globular, very large, pale yellow, very fine, keeping well until Christmas; tree requires to be well pruned as it makes much thin wood.

27. Royal Jubilee—Introduced by my firm, of a rich golden yellow, keeping till January, or may be sold from the tree direct; a great bearer; tree compact, medium size; blossoms late, and so can be planted in districts liable to late frosts; while by its late leafage it escapes the winter moth.

28. Tower of Glamis—Tree spreading; a valuable orchard kind; fruit large and heavy; a good regular bearer when 10 years old; vigorous. November—January.

29. Alfriston—Tree compact and hardy in growth, good as orchard or bush tree; stores well; fruit large. January.

30. Lane's Prince Albert—Wonderful for crop and beauty, keeping well till March; best as a plantation tree. The finest large late Apple for Dwarf trees.

"It is the heavier and later fruits which suffer most by Autumn gales, and therefore such kinds are better in a sheltered orchard."—*Year's Work.*

31. Annie Elizabeth—Growth upright and sturdy; a fine standard tree in heavy soils; keeps firm and is fit for sale in March; fruit conical and firm.

32. Newton Wonder—This grand Apple is specially recommended; it forms a very large Orchard tree and a fertile bush; fruit even, heavy, and as good a cooker as Wellington, which it entirely supersedes. November—February.

33.—Bramley's Seedling—Of most robust habit, fine for orchard standard, one of the best of recent years; fruit large, freely produced, and keeping well till May; does not bear till the tree gains age; grand also as a pruned bush; preferable to Wellington; is now a leading sort, especially for cold soils, and sells well in market. February—March.

The following are very promising, but we must not extend the list too far. Some growers plant these in quantity, but it is not advisable for beginners to experiment, the most reliable 33 are already named:—Sandringham, Edward the Seventh, and Byford Wonder for Kitchen sorts; and in Desserts, Langley Pippin (early), Ross Nonpariel (Oct.), for late keeping, Duke of Devonshire, Rosemary Russet, Sanspareil, and the Cox's Orange Seedlings on page 63.

The whole of these Apples succeed as Pyramids or free Bushes on the Paradise stock, and are worthy of extensive cultivation in that form, planted at 12-ft. apart.

It is a significant fact that many of our best and most careful growers have for some years planted large quantities of Apples, as they feel that the foreigner has no chance against home produce; and it may be mentioned that they thin the fruits, and mulch when a good crop sets, and do all they can to improve the quality. The importance of these operations is the reason of their being here insisted on repeatedly. We

have always maintained that this should be done; with improved culture we shall produce better fruits; and there is but little doubt that the general public will soon learn to discriminate between the bright but dry and often flavourless American kinds and fresh home grown English Apples. None of the foreign Apples cook like those home grown.

GEORGE BUNYARD & CO.'S FRUIT ROOM.—A supply of Apples can be kept for ten months in a properly constructed Fruit Room. Among the Collections which were exhibited at the Temple Shows, London, in May (and for which the firm have gained many Silver Cups) September Apples were staged in good condition. The main point in preserving fruits is to allow ample time for them to become thoroughly ripened before gathering, and then to store the fruit at an even temperature; the natural earth is by far the best floor, if kept damp. We can send photographs of this Fruit Room, with printed description, as a guide to intending builders, on receipt of 2/6. Our Allington Fruit House is merely a match-boarded shed, thickly thatched, and it answers the purpose admirably, and has been much commended by visitors, and those who have followed our directions in building similar structures have been most successful in storing fruit in a sound condition over a long period.

The enormous importations of Apples from Tasmania, California, Canada and America, compete very unfairly with British grown fruit; some allege that they enable many shops to keep open all the year, and thus help the trade. Doubtless the careful manner in which they are packed enable grocers to handle them, but growers are now planting early sorts and very late cookers, and thus clearing out before these come to hand.

CHAPTER VI.

APPLES FOR PROFIT.

A Paper read at the Chiswick Apple and Pear Conference, 1885, By Mr. George Bunyard, V.M.H.

The commercial growth of Apples for market is, I fear, too frequently entered upon hap-hazard, because many start in the enterprise without sound information. Beginners fight shy of the growers of trees for sale, under the unfair notion that they recommend those kinds of which they hold a stock; or they procure the "tip" from salesmen in the various markets, who, as far as they can (and in good faith), give them the names of the kinds that sell well; fruits, so to speak, which dispose of themselves by their names or appearance. Many choice Apples, however, produce but a small crop, or are so long in coming to a state of profitable production that planters get discouraged; other kinds may be recommended which are very slow growers or rarely make good orchard trees, and thus land is not fully utilized. As the markets are supplied from a large area, salesmen have but a general idea of the suitability of sorts to a district, and hence much valuable time may be lost. I venture to give a few hints as to the formation of a *profitable Apple orchard*, or plantation, where the return shall be speedy, and yet in the future, for half a century, shall maintain good results. The first operation is the

procuring of suitable land. In a district where little fruit is grown, an idea can often be gained from the growth of the few fruit trees in cottage gardens, and orchards near gentlemen's seats. If Apple trees show a kindly and clean growth, with an absence of lichens and canker, and if Elm trees flourish, it will so far be favourable. Exposure to prevailing winds is to be avoided either by shelter planting, or, better still, by taking advantage of existing woods and hedges, and a slope to the south or west is to be preferred; but in order to secure a permanent orchard care must be taken to have the land deeply cultivated, or possessing naturally a rich soil, otherwise a few years of fertility may only be the precursor of decay and disappointment.

Having settled on a suitable position, the tenant or purchaser proceeds to put the land in order for planting, either by steam cultivation or by thorough digging or trenching—the latter, though expensive at the start, is of permanent benefit. This operation is best done before the frosts sets in, that the land may settle, and become purified and sweetened by exposure. The ground should then be set out, and standard trees, on the crab or free stock, of the before-mentioned sorts, planted 24-ft. apart; requiring 75 to an acre.

For list of best sorts see previous list—Nos. 1 to 33.

So far for the top crop, the space between being utilised by placing three, two or three year old dwarf trees, between each standard, others at six feet apart in the entire rows, which, less 75 for standards, will be 1,135 per acre, until the plantation is filled up. These dwarfs will produce the best fruit from trees on the Paradise or surface rooting stock, and may consist of those previously named.

In six years' time, the two trees immediately beneath the standards can be transferred to other land, and will, if removed with care, in October or early in November, suffer little from lifting, and in the second year after will produce heavy crops. After the sixth season the orchard would be left with a permanent crop of Dwarf and Standard Apples at 12-ft. apart. The Dwarfs at some future time might be cut away. When the Standards are established and strong, the land should be laid to grass, and thus fodder for sheep keep, and a top crop of Apples could be secured annually. Until the Dwarf trees cover the land, Potatoes may be grown between the rows, or Lily of the Valley, Violets, Wallflowers, or Daffodils. But if land is cheap, the space may remain without crop, and the roots will benefit greatly from the run of all the land. Weeds must be kept down. Where Standards only are planted no corn crop must be taken, but soft fruits may be placed between them for some years. The plantation should be dug in December or January, each year, and be knocked over and stirred with a prong hoe in March.

Oxen and horses should not be allowed in young orchards. Shelter can be quickly obtained by planting outside rows of Damsons or Bush Plums (the latter a Kent sort) with Crawford or Hessell Pears as an inner line, at 12-ft. apart, and this screen would pay its way. If desired, Plums could be placed between the Apple standards, and Gooseberries and Currants, omitting the dwarf Apples. If the land is properly prepared, Apples should need no manure for some years, as the use of stimulants while the trees are young is prejudicial, inducing a sappy unripened

growth, which lays the tree open to damage by frost. When trees are carrying a heavy crop, mulching may be carried out in June, or liquid manure can be used with advantage in the growing time, or Fish Guano, Blood Manure, or Peruvian Guano, at 5 cwt. to the acre, placed round the trees and afterwards hoed in. Such a plantation as described would commence to bring a return from the Dwarf Apples in two years, and the fruit, with a little care in thinning, would command a ready sale, because when grown in this manner it is cleaner in appearance and much larger in size than that from old trees. In three or four years the Standards would commence to fruit, and a larger return would annually be made, and if properly managed, at the end of fourteen years, the crop would buy the fee simple of the land outright.

In order to make the highest price, all fruits should be "graded," to an even sample throughout, be correctly named, and packed carefully, so that the baskets open clean and bright at the market* In the case of choice dessert kinds it pays well to pack them in light boxes, holding two dozen. In fact, we should take a leaf out of the French books, and put up our produce in an attractive form. The pruning in February or March is of the simplest. No Apples should be pruned the first year of planting; for the first three years commence to form the Standard trees by taking out all the inner wood to attain a bowl shape, and cut back the young growth to four or six eyes, to a bud pointing outward; the fourth or fifth year shorten the wood of the current year to six or twelve inches, and

* "If we could only ensure a full year of such perfect fruit as I have seen at a few farms in Mid Kent, the Americans might whistle for any good they could get by sending in theirs. It is the scarcity of best stuff that drives buyers to foreign produce."—*Year's Work.*

keep the centres clear; and after that time let them grow as they like, merely shortening the tips to procure an evenly balanced head, and taking out any crossing growths. The Dwarfs can be cut in to form pyramids or basins, as desired, for two years, and after that be allowed to grow freely. Other matters, such as securing the limbs in a heavy crop, and staking the Standards, will have to be attended to, and the stakes must be removed from the Standards in the winter as soon as the trees can do without support, as the ties are apt to cut into the bark and produce canker; they should be freshly tied each year.

For Apple growing, land need not be contiguous to a railway station, as they will travel well if carefully packed. Storing enables a grower to realise a high price at a time when good Apples are scarce. Where proper stores, such as the hop oasts of Kent, do not exist, a frost-proof shed will do; and if care is taken to store only sound fruit, a thick covering of straw will effectually exclude frost, and keep the fruit plump and heavy. Should 1,200 trees bear half-a-gallon each, at three years old, the crop would be about 75 bushels per acre, which, at 4s. nett (carriage and salemen's charges deducted) would give a return of £15 per acre; at five years, one gallon each would double the produce; and so on. When the top and bottom crop come to pick, an average of half-a-bushel per tree (it is rare for every tree to bear the same year), would give a possible return of £120 per acre. The risk of loss by wind is small with Dwarf trees, and the cost of picking is less than in Standards, and they can be readily thinned and attended to. Large as these sums appear, they have often been exceeded.

A word as to old existing Orchards. My text is—"Woodman, spare that tree." If such old trees are properly thinned in the boughs, and freely manured, in two years they would either be producing good fruit, or if cider Apples, they would so benefit from the improved culture that they should pay for re-grafting with superior kinds. I believe much may be done in this way, as the roots soon respond to generous treatment, and the foundation of success rests upon them. Suitable kinds for grafting old trees would be—Lane's Prince Albert, Lord Derby, and Bramley's, or the smaller dessert Apples, such as Duchess Favourite, Yellow Ingestre or Worcester Pearmain.

APPLES ON PARADISE STOCKS.

In some counties there is yet a prejudice against the use of the Paradise Stock for Dwarf Apples, because, probably in such early trials the trees were some cheap stuff worked on the French Paradise, which is a starving stock, and the trees upon it die after a few years of fertility, or never make lucrative bushes. But the value of Apples on the broad-leaved Paradise Stocks is well known in Kent, and they are extensively planted. They possess the manifest advantage over trees on the Crab, or Free Stock, because from the nature of their surface roots, they commence to bear the second year after planting (and even give some Apples the first year), and being Dwarf trees preferably trained in basin shape, they are readily thinned, easily summer or winter pruned, more under obversation for insect pests, remedies can be much more readily supplied, they carry fruit of larger size, clearer in the skin than Standard trees,

and from their root power, with refraction from the heated soil in summer, the wood becomes riper, and thus they often fruit freely when Standards fail. At the same time a large number can be planted per acre (302 at 12-ft. apart) so that with, say, six or eight varieties, it is very rare even in scarce years that there is a failure. The best varieties are noted, Nos. 1 to 33 in previous chapter, and when planted in alternate rows for the purpose of perfect cross fertilization, annual crops can be counted upon. We have grand old examples of trees on Paradise in our Nurseries, and their life promises to be quite as prolonged as Apples worked on Crab Stocks. Failure sometimes occurs because the trees are planted too "fleet," exposing the stock to the air. These and Pears on Quince should always have the junction of stock and scion 3-in. *below* the surface, otherwise the stock growth is restricted and the growth is checked.

The same remarks apply to Pears on the Quince Stocks—both as to fertility, quality, and culture; for sorts see Chapter VIII.

CHAPTER VII.

PLUMS.

Plums are, after Apples, the next most important crop. As these so soon produce a return, they are planted in great numbers year by year. No doubt fancy prices which the last generation made may not again be reached, but a fair margin of profit will be left. Plums can be planted as close as 15-ft. apart, therefore a plantation soon pays expenses; and when Damsons are included, the return is reached in a few years. Standards are largely grown, but Half-standards find increasing favour, and where the plantation form is adopted, they form a good shelter in the earlier stages, and the stems can be run up by removing the lower branches. We append a list of almost certain cropping kinds, with a short description of each variety.

PLUMS FOR PROFIT.

1. Rivers' Prolific—The best early kind; seldom fails to produce. It is a weak grower, and never makes a big tree; perhaps better as a plantation kind, but there is nothing yet equal to it as a first early sort. Fruit small, purple. End July.

2. The Czar—Early, bearing in clusters, and carrying a fine bloom; a very free grower. Fruit purplish red, round. Makes a fine upright tree, and on that account valuable for plantations, as it does not obstruct the sun; succeeds where others fail. Mid-August.

3. Victoria—The best all round Plum; it is not a sufficiently sturdy grower to carry its heavy crops, the wood being very brittle, and consequently the tree never gains the size of others, and therefore requires severe pruning for a few years to encourage sturdy growth. Fruit pink, oval; a market favourite. August.

4. Belle de Louvain—Growth very free and upright, bears regularly very large oval purple fruit; handsome and quite first class. End August.

5. Jefferson's Gage—The most prolific of the class; growth upright and sturdy; fruit large, egg shaped, yellow and green with red spots. August.

6. Old Greengage—Not a certain bearer, but yet so valuable, that where it "hits" the lucky possessors have a fortune. It is well grown in some counties, and appears to do best on grass lands. Every large growth should have a proportion of Gages. Tree small.

7. Kent Bush or Waterloo—One of the best for market. Very strong and hardy, and produces fruit all over the tree, and seldom breaks with its burden; its skin is tough and it travels well. This is a favourite Jam Plum, and trees can produce 20 bushels each. Fruit round, dull red to black. September.

8. Pond's Seedling—Fine as a late September kind, never heavily cropped, but the fruit is immense, and always sells at a long price, as the buyers can punnet the fruit, and get as much as 3d. each retail. Must be kept pruned while young. Fruit red oval.

9. Monarch—A grand October purple kind, of sturdy upright growth; a most valuable sort.

10. President—A very large deep purple Plum, most promising for a late crop; free in growth and superior to Monarch in size.

11. Wyedale—Tree upright, growth vigorous; fruit red, produced late in October; a valuable hardy late kind.

Gage Plums—This class are not regular bearers, and although they make a good price, may be omitted, unless a large acreage is planted. The following have done admirably in our plantation: Denniston's Superb Early, Oullin's Golden Gage, Early Transparent Gage, Golden Drop, Comte d'Althan's Red Gage, Late Orange, Reine Claude de Bavay, and White Magnum Bonum. When the latter come large and fine, it is better to gather them before they are dead ripe, and send them to market in boxes—one layer in each box.

Mirabelle Plums—These cherry Plums are grown largely on the Continent, but often fail here because they blossom so early. In sheltered positions on the South and West Coast they fruit profusely. There are both red and yellow kinds. Grafted trees should be purchased, as seedlings are not reliable.

DAMSONS AND PRUNES.

These are extensively planted, and are valuable for banks and exposed places. The Kent Cluster is a good tree as a protection from gales on the outsides of plantations, and where the ground on both sides of the field is in one person's holding, they may be advantageously planted in the hedges, and a quantity of fruit taken where larger trees would be an objection. The sides of roads or near footpaths should be avoided. All Damsons are valuable for preserving, and are largely used for wine making and dyeing. The only kinds recommended for extensive cultivation are:—

Bradley's King—This makes a close tree, bears most profusely, and is certainly the best of the class; fruit very rich in flavour; leaves small.

Frogmore Damson—Free grower, resembling a Plum, good cropper, large, and very luscious in flavour, ripening earlier than others.

The Cheshire or Shropshire Damson *(see illustration)*. Much confusion exists as to this. The one grown at Maidstone is that called the Pruant Plum in Covent Garden, and makes a large flat weeping tree. The fruit is very large for a Damson, oval and of rich flavour, and, provided the branches of the trees are kept well thinned, crops regularly; often hangs till end of October. Trees of this kind, if left to themselves, become unfruitful from the mere overcrowding of the branches. Unless fully ripe it does not cook well.

The Kentish Cluster (Farleigh, or Crittenden). The profusion of fruit this produces can scarcely be credited, and so large is the growth that it is customary in estimating a crop to treat them by the ton. One local grower took 3,000 bushels in one (scarce) year, and made 14s. per bushel of them. The trees require to be hard pruned in for a few years until a head is formed, otherwise, before there is sufficient branch strength the first heavy crop breaks the boughs, and the tree is disfigured for life. They soon form symmetrical heads and are most beautiful in flower, and still more so when laden with their rich violet fruit. Bushes or Half-standards are recommended for exposed places; Standards for orchards. Budded trees are less liable to blight than those from suckers.

The Mereweather—Introduced 1909; fruit as large as Rivers' Prolific Plum, produced in dense clusters;

rapid grower. At present the trees are expensive, but will come to ordinary price in a few years.

The Hereford Prune Damson—This is a large-fruited one, but not so big as Cheshire. The tree is slender in the wood, and of an upright growth, with small pointed leaves much curled. It bears well if thinned out as recommended above.

White Damson—The tree grows freely and produces rich oval orange fruit late in the season, which sell well in market, and make a delicious preserve. (This is not a Bullace).

Burbank's Giant Prune—An American novelty, which will prove of value for a late crop. It resembles Pond's Seedling, and is of Plum size, bears freely, and the tree is robust and branching. It hangs a long time on the tree and travels well.

The Damascene of Worcester does not seem to flourish out of that county.

BULLACE

Are similar in habit to Damsons. The greenish yellow round fruit is produced very late, and occasionally brings good prices. The "Shepherds" is the only one worth culture.

Veitch's Black Bullace—This novelty is as remarkable in bearing as the Farleigh Damson, and from its lateness (October and November) will prove of value.

CHAPTER VIII.

PEARS.

Market Pears must be divided into two classes, as few kinds can be profitably grown as standards for market sale.

ORCHARD MARKET PEARS, arranged according to their season, that can be sold from the tree:—

1. Doyenne Summer—Is the earliest Pear, very small, but freely produced. The tree grows vigorously on Pear stock, or when grafted on old trees. July.

2. Chalk, or Crawford—One of the best. From its ample foliage sometimes used as a screen in plantations. This Pear has no quality but sweetness, but it bears regularly; and from the fruit being culled early the tree recovers itself, and so fruits annually. Moderate compact growth. August.

3. Jargonelle—Growth rather pendulous, but with care in pruning a good tree can be formed. Too well-known to need remark; it sells well. August and September.

4. Hessle (Hazel of the Markets)—Tree moderate in growth, pendulous. Requires to be well thinned in the branches, and produces fruit in long festoons, in the greatest profusion. It is of a mealy nature, and travels well, hence it is a capital market Pear, and pays both grower and retailer. September.

5. Dr. Jules Guyot—Like Williams in shape and colour; a profuse bearer, and very hardy and productive. Growth compact; very fine on dwarf trees upon the

Quince, when it should be planted 6-ft. apart; selling well put up in boxes. September.

6. Williams—This is a Pear that Londoners delight in. It grows to a large upright tree, and as a rule pays well. The branches should be shortened while the tree is young, otherwise when laden at the points, the tree "thrashes" off its fruit. Fine on Quince in plantation from September.

7. Petite Marguerite—A very sweet round Pear from America; fruits profusely, and makes a well shaped orchard tree, or a bush on Quince. September.

8. Beurré Capiaumont—An upright grower, bearing its long thin brown russety fruit in profusion. Very compact and sturdy tree. October.

9. Fertility (Rivers')—Very prolific; in the style of Capiaumont; free grower; excellent. October.

10. Red Robin—Growth bushy and compact; fruits with a bright red cheek; flavour sweet and juicy. This variety is cultivated near Norwich, and sells freely in market. October.

11. Doyenne Boussoch—Forms a sturdy standard and bears profusely and regularly; fruit large and handsome.

Pears for Baking are receiving more attention; the best for this purpose on Standards are Catillac, Vicar of Winkfield, Verulam or Black Jack, and Winter Windsor.

DWARF PEARS ON QUINCE STOCKS.

Where the soil is rich and deep, and the climate suitable, the following grand Pears should be grown as free pyramids on the Quince, and when the trees bear a full crop they should be heavily mulched in May and be afterwards watered with liquid manure,

be carefully thinned and laid open to the sun by removing excess foliage, etc. In planting these the junction of scion and stock must be 3-in. below the surface. For sale in boxes by the dozen :—

12. Souvenir du Congrès—Very large and handsome, free bearer, (best on Pear stock). September.

13 and 14. Dr. Guyot and Williams—Previously described.

15. Beurré Bosc (Calebasse of the Markets)—Rich russety brown ; long ; succeeds as a standard in good soils on Pear stock only. November.

16. Clapp's Favourite—A pretty fruit bearing fairly, well-grown examples make good prices. September.

17. Beurré Jean Van Geert—Medium sized, sweet ; most profuse bearer, has a bright red cheek, which adds to its market value. October—November.

18. Conference—A handsome russety long Pear, very fertile and of excellent flavour ; be careful to market before ripe. October.

19. Doyenne Boussoch—See 11.

20. Doyenne du Comice—The best Pear ; this has now a market name and sells at the highest price ; it is best on a wall, but grand fruit can be secured on dwarf trees. November.

21. Beurré Alex. Lucas—Very large clear greenish yellow, of sweet and pleasant flavour, and a good bearer. Very fine.

22. Durondeau—Large, bronzy red, very fertile and handsome. October.

23. Emile d'Heyst—profuse bearer, medium size, first-class flavour, and very prolific both on Pear and Quince ; can be planted 8-ft. apart.

24. Fondante de Thirriot—A little known but excellent sweet kind, large and fertile. November.

25. Louise Bonne of Jersey—Remarkably handsome, rich and juicy. Early October.

26. Marguerite Marillat—Immense; a very handsome fruit; tree upright, somewhat unequal in growth, but very fertile; plant 8-ft. apart. End September.

27. Pitmaston Duchess—The best large market Pear. This grand variety is found to succeed well on Pear or Quince, and also when grafted on other kinds. It bears the largest size fruit, which, on ripening in October, become a beautiful yellow colour; has attained a high position on the markets; Kent growers have made large sums by their crops. Flavour sometimes fine, but always passable, and it travels well. October and November.

Pears require careful storage in a cool dark place. No better fruit can be found for training against walls or on the buildings than the kinds named, to which may (for walls) be added Beurré Diel, Glou Morceau, Beurré Hardy, Easter Beurré, and Marie Louise. Well trained trees are an ornament to any dwelling house, and all these bring good prices, as much as 40s. per bushel; 4s. per dozen being realised for finest examples. Christmas Pears are not profitable to store.

CHAPTER IX.

CHERRIES.

Cherries as tall standards are mostly grown on grass, with sufficiently long stems to allow horses or cattle to graze without injury to the lower branches, and are cultivated to perfection in Kent, Bucks and Worcester. Very profitable also are plantations of the Kentish and Morello on pyramids, which, after the first two years, only require regulating, and bear most profusely. The famous Grant's Morello Cherry Brandy (manufactured here), and which, apart from its qualities as a beverage, is also a fine medicine in cases of diarrhœa and dysentry, is not made from the Morellos such as grow on walls, but from a local wild Morello, and in the Canterbury district is found in most cottage gardens.

Apropos of birds, the Cherry's great enemies.—It is of no use, in looking for profit, to plant a few Cherries, as they cost more "to keep" than the farmer can afford; and for the same reason it is better to plant a number of one kind, alternated with a distinct sort, but where several sorts are grown the season is lengthened out; one man and a gun can keep many acres; and bearing in mind that other trees can be planted between them, and produce a return before the Cherries pay their way, it would be well to plant freely, as no fruit sells better. Some idea of the value of Cherry Orchards can be had from the figures given in Chapter XXII, on Profits.

WHITE HEART OR BIGARREAU CHERRIES.

1. Frogmore Bigarreau—A valuable early kind ; free grower ; profuse bearer.

2. Bigarreau, Kent, or Amber Heart—Well known as the finest for general crop ; makes a large tree.

3. Napoleon Bigarreau—Valuable to succeed No. 2 ; a free grower and good cropper, being large and late, it makes good prices.

4. Florence, or Wellington—Very large and late, hanging well on the tree. These are generally kept back as long as possible, and often realise 30s. a bushel, sent up in peck baskets.

BLACK HEART CHERRIES.

5. Rivers' Early—A very fine sort, now extensively planted ; the earliest black ; a good cropper and grower. This has become an established favourite ; it requires pruning the first five years to get the branches erect, being naturally a pendant grower.

6. Knight's Early Black—A free bearing sort of splendid flavour.

7. Black Heart—A fine old favourite, ripening early ; very hardy.

8. Black Eagle—Very large shining fruit of excellent flavour ; travels well ; free grower.

9. Waterloo—Extra fine flavour ; does not crack in wet weather, and hangs for a long time fit for market.

10. Black Tartarian or Circassian—Strong grower, producing enormous fruit ; about the latest to pick.

11. Windsor—A hardy American variety that produces very freely ; growth compact ; fruit reddish black.

There are many local sorts and some new ones that we think will prove useful, but many prove synonymous with older kinds.

DUKE CHERRIES.

These are not much grown for market, as they ripen early, and have such tender skins that the birds play havoc with the crop, which moreover does not come to gather all at one time. Where a warm spot will admit, a few might be tried, as they sometimes pay well. All are close upright growers. In France they are called "English."

12. May Duke—Upright growth; bright red fruit.
13. Royal Duke—Large and fine.
14. Archduke—Large shining blackish-red fruit.
15. Late Duke—Crops freely, and comes quite late; good.

RED AND MORELLO CHERRIES.

16 and 17. Kentish or English, and Flemish—Are very similar, and form compact and pretty trees. They always make a good price, and are good nurses to plant on the outsides of orchards. They are not much for dessert, but invaluable for jam making or drying, and bear freely about every other year. These are the Montmorency Cherries of France.

18. Morello—Is worth growing as a standard, and bears freely, and produces very fine fruit, while as bushes they are most lucrative.

Before dismissing Cherries, we cannot but remark that many empty walls about the farm and farm buildings on the shady side, that will not do for Pears and Plums, could be advantageously planted with Morello Cherries. Such fruit can be netted, and if sent up neatly packed two layers in a box, bring 6d. to 1s. per lb., sometimes more. After all it is these little matters that tell up, and trees cost little to keep in order; pruning once a year being all that is necessary.

The Grass in Cherry Orchards should never be mown for hay but be closely grazed, and cattle should be freely fed with corn and cake; the trees will well repay any outlay upon them. A local grower states that he fatted three lots of sheep per annum in his orchards upon this plan, and then sold the ripe Cherries for £1,000.

I am persuaded that a great per centage of our Cherry Orchards are not sufficiently manured.

CHAPTER X.

WALNUTS AND CHESTNUTS.

What place do these find in the market for profit? some will say at once.

WALNUTS are not so long in coming into bearing as many imagine, and are well worth attention, at any rate at landlords' hands. The green fruit always commands a price for pickling, and in this way the trees want no minding. Possibly the "husks" or skins of the ripe nuts may be used for dyeing as well as catsup; and the ripe nuts are among the most generally appreciated of table fruits. Again, as timber trees they are not to be despised, and as the time may be far distant when our "spears are beat into pruning hooks" the wood will always command a price for rifle and gun stocks. In America there is already a wail from the furniture maker that walnut wood is scarce, and no doubt the recent fashion for furniture, other than in mahogany, will not die out for many years. Walnut is among the best now used.

SWEET CHESTNUTS are less valuable; still they are worth planting in parks for their splendid foliage and general appearance, and the nuts are always useful for cattle food; the largest can be sent to market, and the small ones be used for cattle feed or be sold or planted for seed.

Nurserymen can supply both these in large trees, which, provided they have been properly prepared, move well. They require staking at once on planting.

CHAPTER XI.

BUSH OR SOFT FRUITS.

Having dealt with *trees* we now reach these very important fruits, at once the cheapest to buy, the quickest to repay for labour, and the easiest to manage. We must first take

GOOSEBERRIES.—An all important crop. It is a good policy not to have all one's eggs in one basket, and with this fruit we have two possible markets. They can be gathered green, and in many respects this is the best; as the trees benefit and strengthen for the next crop, and no trouble is caused in keeping them from birds, and picking is over before Currants are coloured. On the other hand, if Cherries are a failure, ripe Gooseberries sell well, the best (for ripe fruit) being the Yellow Rough, Lancashire Lad, and Warrington. These "ripe" berries must be marketed when only slightly coloured, or they will not travel without smashing.

Gooseberry Mildew.—This so called American pest has appeared now all over Britain, in spite of the action of the Board of Trade. It must have a serious effect on the planting of Gooseberries. The growers of plants cannot possibly guarantee freedom, as the spores travel a long distance, and new plantations may become affected, even where the bushes were free when sent out. The disease is worse in such cold wet seasons as 1909-10, and a cycle of warm years may possibly stamp it out.

It is best at the first picking (green) to gather the berries nearest the ground, next to gather the outsides, and thin the central fruits before the final clearing; many go over the bushes 8 to 12 times.

The larger berries do not travel so well when ripe, though Whinham's and Crown Bob are very handsome, taking fruit. There are but few kinds needed.

1. Whitesmith, White Swan, or Velvet, for picking early green.
2. Early Sulphur, or Yellow Rough, for early ripe berries.
3. Warrington, for late red berries, or under trees.
4. Rifleman, red, form large bushes.
5. Crown Bob, red, best in Devon and Cornwall.
6. Lancashire Lad, red, close grower, heavy bearer.
7. Whinham's Industry, makes large upright bushes, and is equally valuable for green or red berries; produces a heavy crop; the growth being upright, Bullfinches do not take out the buds so readily as in others.
8. Keepsake, remarkable for its earliness; the raiser frequently sends the first fruit to London markets, and has made as much as 52s. per bushel, and £120 per acre of this kind.
9. May Duke, or Bank of England, a variety which is the earliest to pick in a green state, when high prices can be made. The ripe fruits are deep port wine red.

Keen's Seedling, Dobson's, and Superb are similar to Warrington, but have larger berries, and produce most abundantly.

No. 4 makes the largest bush; 3 and 6 grow close to the ground, and can be planted 5-ft. apart. Nos. 4, 5, and 6 produce the largest berries; but one with another, nine better varieties cannot be found, although we have tested 150 sorts.

LANCASHIRE PRIZE GOOSEBERRIES as a rule are not strong growers, and trees cannot be sold so cheaply as the above, but they are worth notice for sale in punnets, when their large size commands a price. No doubt many of these will pay to grow where the Gooseberry succeeds, and the demand for them in punnets in the London shops is yearly increasing.

Among the best for this purpose are:—

GREEN.	RED.	WHITE.	YELLOW.
Ocean	Crown Bob	Alma	Gunner
Telegraph	Lancashire Lad	Antagonist	High Sheriff
Shiner	Speedwell	Lancer	Keepsake
			Leveller
			Ringer
			Sandwich Yellow

Avoid planting the Ironmonger, Scotch Red Rough, and White Shiner, as they are too small for market. In many cases high prices are made for Gosseberries green; and if a warm corner can be found, Keepsake or Whitesmith should be planted, and a little assistance be given in liquid manure, if the season is dry; as well as a shelter from cold winds, say about 9-ft. high—such as is used for sheltering hops. A few bushels at 24s. to 30s. are well worth the trouble. Gooseberries require a rich well-manured soil. Strong nitrogenous food is to their liking, but unfortunately those who are the best cultivators suffer most from the American mildew. Fish Guano and the Sheppey Meat Manure are about the best; where near the coast Seaweed answers admirably, and Sprats are excellent.

CHAPTER XII.

CURRANTS.

BLACK CURRANTS.—This fruit is heavily planted, and about which controversy is always at work as to sorts. There is none yet produced equal to the Boskoop; but as some kinds succeed where others fail, it would be better to plant a proportion of each. No other fruit produces an equal return per acre, year by year, and they can be grown on damp soils. (See special note on the dreaded Black Currant mite, under Insect Pests).

1.—Boskoop Giant—This is much more vigorous and larger in berry than others, and has quite taken the lead, as it produces the largest berries in fine bunches, being more readily picked than any others, and is less liable to attacks from the mite; blossoms late and yet comes early to pick.

2. Lee's Prolific—The sweetest, and the second best in all points. Hardier than others.

3. French Black—A very profuse bearer, forming a compact bush.

The Black Naples has quite gone out of cultivation. Some yet prefer the old Red Bud and the Champion.

WHITE CURRANTS are but little grown; they sell well in punnets. Versailles is the largest; White Dutch the best flavoured.

RED CURRANTS.—Here again there is confusion as to sorts—our great doctors cannot agree—so we adopt their local Kentish names. Treated in the way

referred to in "Pruning," these produce heavily, and rank in profit very close to "Blacks," as they can be grown on sandy and light land, where the latter would not succeed. They fetch the best price when gathered scarcely ripe, even with green berries on the ends of the bunches.

4. Scotch Red, Cherry, or Knight's Early—Growth upright, berries large, bunch short, first-rate.

5.—New Red Dutch, Chiswick Red—Medium season, grows freely, and makes a large open bush, is a profuse bearer; dark crimson.

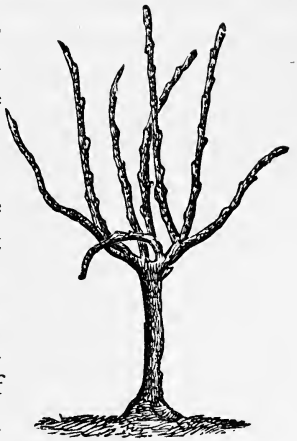
6. Raby Castle—Makes a large bush, and produces fine deep red berries; late.

7. Fay's Prolific is of the Versailles race, and produces very large sweet fruit, but the shoots are liable to break off the stem. We find Comet and Walker's Mammoth to be the same as this.

The above are the only kinds recommended for market growth.

CHAPTER XIII.

KENT COB NUTS AND FILBERTS.



We figure a Kent Cob Nut, as prepared to form a basin-shaped tree. In some counties these are allowed to grow as they please; but freely pruned trees produce the largest and best nuts. The little leg or stem is useful, as it allows the weeds to be cleared away from the under branches.

These are a special Kentish culture, and the mode of pruning is previously described (in Rochester Paper.) There are frequently upland soils which, to use a common expression, grow stones—loose shattery soil, with a mixture of tentative loam—here they flourish, and although like other things they may do better elsewhere, they there produce a very profitable return; the only objection to their culture is the time they take to come into full bearing, though the vacant space between the Nuts can be filled with Strawberries, Currants and Gooseberries, and a full return obtained before the Nuts pay their way, which would be in about five or six years. In such bleak situations they could be "topped" by planting standard Plums and Damsons—the one helping to shelter the other; but in that case the standards should not be planted too thickly—say 48 to an acre. In better soils Pears and Apples can be grown above them, as is

frequently done. Cherries must not be planted, as the winter digging which Nuts require does not suit them. There are but few kinds.

1. The Lambert Filbert, or Kentish Cob, is the best; it grows more vigorously, the crop being nearly double that from others. The Nut is very large, thick shelled, and usually produced in bunches of 3 or 4 (though in a bad season many single and double Nuts are found), even up to 7 or 8; the husk is large and shows the Nut. In Kent many are grown among or near hops, and must then be picked green before the hop-pickers arrive; sometimes causing a glut in the market. When gathered they are best heaped up on a floor 2-ft. thick to harvest; they are turned over from time to time to prevent mould; though they do not require to be quite dry, otherwise the kernel shrinks; generally fetch highest prices about ten days before Christmas. For home use Nuts are better kept in jars or tubs, a little salt being sprinkled in, which keeps them damp, when they come out full and eat crisp to the last.

2. Kent Filbert—Better flavoured, but not such a good cropping Nut as the Cob, and cannot be recommended for extensive culture.

3. Cosford—A round Nut, of very nice flavour. Very free bearer, but from its thin shell it is liable to be appropriated by the squirrels, mice, and rats. It is, however, to be considered on one particular point, viz., the profusion of male catkins it produces, thereby fertilizing others to advantage.

4. Prolific Frizzled Filbert—A very free bearer, producing handsome bunches of well-flavoured nuts, often 15 in a cluster, long before others are ripe.

5. Pearson's Prolific Cob—Small but free bearing variety, like No. 3, valuable for its catkins.

For particulars of culture see Chapter IV.

CHAPTER XIV.

STRAWBERRIES.

This fruit is so universally appreciated that it will probably never be over-planted; its only drawback is cold and dismal weather occurring in the ripening season, causing a shrinkage in demand and low prices; it makes such a delicious preserve, and from its sweetness and flavour is amenable to "treatment" by the preservers, is always in great demand for Jam; while the large northern towns take enormous quantities either in punnets or peck baskets in a loose form for preserves. There are a great number of kinds, but the following will keep up a good supply in succession:—

EARLY.

1. Royal Sovereign—A remarkable kind, which completely eclipses all others for the first crops. It is robust in growth, free in cropping, and altogether A1 for market sale. It bears very fine large scarlet fruits, and continues to crop over a long season.

2. Garibaldi, Stirling Castle, or Vicomtesse de Thury—A first early kind, which produces freely moderately-sized fruit; and from its copious foliage the early bloom is protected from the spring frosts. Fruit bright shining dark red; fine for preserving or bottling, but of no value for punnets.

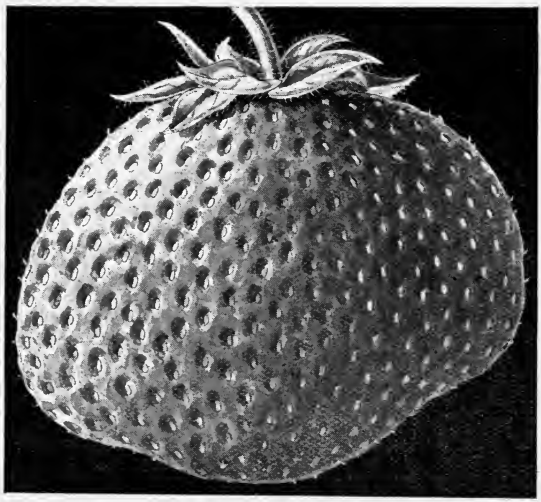
MEDIUM SEASON.

3. Sir J. Paxton—Very bright shining red, of good size, and one that travels well. It grows freely, with good constitution, and is the best for general main crop.

4. Fillbasket—An enormous bearer of fine flavour, fruit rather pale and long. This has done well in our Kent fields.

LATE.

5. Givon's Late Prolific—Fruit very large; as it commences to ripen when Paxton's are done, this will prove of great value when better known, as it resists the scorching July sun better than any other, and its ample foliage protects the fruit, which is of a deep red colour and fine flavour.



Givon's Late Prolific.

If the land is very suitable for Strawberries, the old "British Queen" may be tried, though "Dr. Hogg" is a better form of it; but as a rule, except where a first-class trade is done, "Queens" do not pay. Planters should be very chary of planting new kinds, as so many fail to come up to market standards, though of value in gardens.

In reference to this matter, many recent introductions crop freely and produce very large berries, but they are too soft to travel, and in a wet season like 1909 they are useless. The growers find nothing more reliable than Royal Sovereign and Sir J. Paxton.

Strawberry crops are amongst the most profitable, and no plant better repays for careful cultivation. Fresh plantations should be made every year, as unless under exceptionally favourable conditions, they cease to be profitable after five years, and a portion should be destroyed annually. After a few years' rest, the land can again be used for the same purpose. Pasture land is apt to contain wireworm, and is therefore to be avoided for Strawberry cultivation, unless after an intermediate crop of potatoes or corn. In light land the Cockchafer grub is very troublesome, a royalty being placed on the perfect insects (May Bugs), growers paying so much per dozen for its destruction. The presence of the larvæ is shewn by the Strawberry foliage drooping. The large white grubs will be found at the root, on lifting the plant.

Special notes on packing see Chapter XX.

THE MARKET CULTURE OF STRAWBERRIES.

An extract from a Paper read before the Royal Horticultural Society, 1889, corrected to date.

My friend, the late Mr. Barron, has given you a full and complete history, and named the best in all the families of garden Strawberries. I have therefore only to deal with their culture on a large scale for marketing, or for the manufacture of jam. The Strawberry is a very perishable fruit, and even in a few hours that elapse before it is put upon the market, its freshness, piquancy of taste, and bright appearance, have more or less departed, in consequence of the packing and jolting in transit. This is unavoidable; and although many growers send the fruit direct to market in their own vans, still this liability to damage has the effect of reducing the selection of kinds that will travel to a few varieties, thus excluding some of the best in flavour, from profitable market culture, as appearance is a great factor from a paying point of view. I have visited the Kent plantations in full bearing, and can state from experience that fruit grown in the open is far superior to any that is produced in closed-in gardens, obviously because the sun from its earliest morning awakening to the fading beams of its western rays is full on the plants the whole day. These conditions cannot be expected in walled gardens, or in places surrounded by trees. A full play of air and warm winds tends to ripen and flavour the fruit more than is generally expected. To proceed, the largest

district for Strawberries is probably that near St. Mary Cray and Swanley, in Kent, where the culture assumes enormous proportions. I note in the visit of the Lord Mayor to the district lately, that one grower is said to have as many as 2,000 acres, and that, besides 300 tons of fresh fruit sent to Liverpool, he made 60 tons of jam per week.—*(Gardeners' Chronicle).*

There are many others who do an equally extensive trade in that locality, and the reason for this is probably: because formerly in that district there was much poor woodland, which the tenants were allowed to grub and bring into fruit culture at a nominal rent, which would be eminently suitable for the purpose, as deep steam cultivation, upheaval of the roots, etc., would form a good fresh natural basis, combined with the humus of the soil, upon which to start new plantations of Strawberries; the cheapness of London manure, and its ready means of transit by rail, have also aided culture, and of course the same rails (S.E., Orpington, and C. and D., Swanley) could take the fruit to market, while the distance from Covent Garden and the Borough London Markets, and other centres of distribution, was not too great to allow of road carriage, though many prefer to send their own vans ready loaded to the local station, and forward them by rail, transferring them with their own horses from the terminus direct to the salesmen, but of late years by motor lorries. The soil of the "Cray" district is eminently suitable for fruit culture, being light, and more or less mixed with stones and flints; but the main secret of success is the heavy manuring given to the land with every crop, and the intelligent culture bestowed. Sir Joseph Paxton is still a favourite sort, and it possesses all

requisite qualities for the purpose, being a handsome glossy fruit, of good firm substance, a great bearer, and a hardy free grower, with good foliage and stout footstalks to keep the fruit off the ground. Stirling Castle (or Vicomtesse de Thury) is also grown, and a few Eleanor and Elton Pine for later crops. Since this paper was written, Royal Sovereign has been introduced, and is the best for early crop; but Monarch is also a favourite where it succeeds, though often blind under garden culture. Other novelties are the Laxton, Fillbasket, Bedford Champion, etc.

The usual proceeding is to place the finest and best fruit into 1-lb. punnets, and later on, when the price falls, into 12-lb. peck baskets, which are made with necks slightly smaller than the body, so that they do not require covering when sent by rail, but pack one on another, and the fruit is thus sent in special trains to Manchester, Liverpool, Birmingham, etc., in better condition than would be expected. The punnets are put into cases made to hold 24 or 48, or into light open boxes with handles at each end; some cover the layers of punnets with cabbage leaves to keep them cool. A large sale is also effected in handled-chip baskets holding 3 and 6-lb. each.

In recent years, the "King" or giant fruits are sent to market in special punnets, and being the very largest berries they obtain a high price, and are neatly furnished with fresh leaves.

Planting.—The plants are set in the fields in straight rows, 32 inches wide, the plants being 16 inches apart; such a plantation lasts from four to seven years in good bearing, according to the soil or the seasons. The hot seasons, by encouraging red spider, considerably weaken the plants, and make gaps in

the rows, and severe frosts after a wet time will sometimes kill them. New fields are planted at the end of September, but if dry weather then prevents, planting is best deferred till March, as the winter frosts draw the roots out of the ground if not established. It would pay growers to have a reserve of some thousands of pot plants, to replace failures in the first planting.

Picking lasts from four to five weeks, the pickers being paid by metal tally for each peck picked, to be turned into cash, or goods at the local shop, as they require it. The pickers are generally housed on the farm in lodges erected for the purpose. A marked improvement in the care for their welfare has been manifested in late years, and, although their condition is a happy one in fine weather, compared with their crowded life in towns, it must be very trying in wet seasons, as they have to be out by three o'clock in the morning to secure the first supplies for the early trains. They are, however, generally cheerful and willing; the fact that each one can earn a fair wage by diligence and activity stimulates them to work with a will. My informant states that the largest day's picking at Cray was about 6,000 pecks, of 12-lb. each. At Swanley Station 80 tons was the largest quantity forwarded in one day—*i.e.*, 15,600 pecks.

After treatment.—As soon as the crop is gathered, the side runners are removed with a bagging hook; the straw used in mulching is also removed; the land is then broken up between the rows with a horse hoe and cleared from weeds. Any manure necessary would be put on when the runners are removed, to stimulate the formation of stout crowns. Digging is objected to.

The rows of plants are then moulded up with a light plough on each side to keep the crowns warm and dry in mid-winter; any excess of rain draining into the furrows.

Mulching is done about the first week in June, clean barley straw being used at the rate of about 1½ tons per acre.

This is the Kent plan. At Sandwich (Kent) the finest British Queens are grown, and the culture there differs in wider planting, possibly because of deeper soil, while four years are considered long enough to keep a bearing crop on the land. The one year's plants (those set September to March previous) have the flowers picked off by hand the first year, to strengthen the stools, and in all cases the land is kept scrupulously clean from weeds.

Manure.—Rich farm-yard manure is preferred, as much as 60 tons to the acre; shoddy and soot are used, the latter tending to keep down slugs, while it is recommended as a spring stimulant.

As is well-known, the Aberdeen Strawberries come in after the Southern fruit is over, and they grow many more kinds: Vicomtesse de Thury, Black Prince, King of the Earlies, for the first crops; and Myatt's Improved, Rivers' Eliza, Paxton, President, Duke of Edinboro' and Keen's Seedling, with British Queen for main crop. They are planted 30 by 15 inches apart, and three years is considered the limit of a paying crop, but on deep or very highly manured soil, as much as eight years. By the use of both early and late sorts the picking is extended to eight weeks. Planting so far north is necessarily deferred till April. The between alleys are lightly dug during

spare time in winter; the greater rainfall in the North doubtless settles the soil in that district, and thus what would be a wrong practice elsewhere, is a success in Scotland.

In the Evesham district, the general practice is to plant 30 by 18 inches, and to retain a plantation four or five years. Sir Charles Napier and Paxton are grown for punnet work, and Stirling Castle and the old Scarlet Carolina Pine or Grove End for jam; the latter, although small, making the best preserve, the fruit keeping its whole condition and colour. In recent years, Royal Sovereign has taken the lead, and heavy crops of The Laxton, Climax, etc., are grown, but Royal Sovereign is the best all round berry. The picking lasts about five weeks, and planting is done in early autumn and spring. After the crop is gathered, the runners and spare foliage are removed by bagging hooks, and the mulch taken off. Hoeing is then done by hand or horses, and the plantations are left till the spring.

Cornwall supplies the first market Strawberries; Alice Maud is their best early; President, Paxton and Royal Sovereign for main crop (but the Southampton and Botley growers have lately been quite as early producers). President carries badly, and is used for home markets. The Cornish plant is closer than others—20 by 14 inches for Alice Maud, and 26 by 16 inches for others. From the nature of the soil, possibly, and in consequence of copious manuring and more frequent rains, the Cornish beds last as long as fifteen years. This greatly adds to profit. A friend there picks 100 tons a day. When it is considered that no jam is made, this represents a large quantity of pound

baskets. The picking lasts four weeks. New plantations are made in September, following a crop of early potatoes if possible. A feature in my informant's notes deserves mention. He keeps his hands on the farm all the year round, the winter months being utilized in making punnets, for which he has invented labour-saving machines. To sum up the various reports, the first point that strikes me is the few kinds grown; but the public are very conservative, and new kinds are not popular in the market.

The Southampton, Botley, and Swanwick districts are extensive growers of early Strawberries. The culture differs in some respects from that in Kent. They take special pains to hand lay the early runners, and plant them out as soon as possible, and in this manner they secure an earlier crop and larger berries, some five days in advance of permanent field beds. I am informed that no less than one and a half millions of baskets were sent from one station, over 118,000 in a day. Special trains are supplied by the London & S.W. and Great Western Railways, which carry the fruit all over the kingdom, *via* Willesden, 22 boxes being reckoned as one ton. In the above districts the small holder has a great opportunity, and the Swanwick and District Fruit Growers' Association has 320 members, who by combination help each other, and are able to bring pressure on the carriers to their mutual benefit. They confine their sorts to Royal Sovereign, The Laxton, and Leader. The latter, though not a first-class berry, gives enormous crops and late fruits. Late varieties do not pay, and Paxton has almost died out in the district. This special culture is made feasible from the fact that they do not

get those severe frosts which in other parts might lift Autumn planted Strawberries.

The Sir Joseph Paxton has been the most reliable sort for the Kent growers, but it has (with others) deteriorated, because of the new plants being taken from worn out fields which have borne heavy crops, and, to remedy this, I suggest that a special acreage be well manured and the plants be put out 3-ft. apart as early as possible. Then the flowers should all be cut off the first year; this will enable the stools to send out vigorous stolons, and form extra strong runners in the spaces around the plants. Further, it would be a good plan for growers to make arrangements for friends at a distance to cultivate in this way, and make an exchange, as it is found that such renewals are very beneficial, and give fresh vigour to the plants.

In our own private culture we find the following most productive and reliable, and for *home sale or garden culture* I think the selection cannot be improved:—

EARLY.
Black Prince
Royal Sovereign
Vicomtesse de Thury, or Garibaldi

MAIN CROP.
Fillbasket
Sir Joseph Paxton
British Queen
President (Green's)
Louis Gauthier (white)
John Powell, or Goliath
Countess
Dr. Hogg
Reward

LATE.
Eleanor, or Oxonian
Filbert Pine
Givon's Late
Laxton's Latest
President Loubet
Waterloo

PRESERVING.
Vicomtesse de Thury
Grove End Scarlet

The Autumnal fruiting sorts—Continuity and Antoine de Padoue will become indispensable for private garden use.

Preparation of Land.—In order to insure success, deep culture and heavy manuring are necessary, and this should be applied *before the crop is planted*, as it

cannot afterwards be done so readily. I should prefer to mulch with long manure, but it cannot always be had in sufficient quantity. There is no doubt that such strawy horse dung, turned once, and applied early in May, greatly assists the plants in making foliage, strengthening the blossom, and increasing the size of the berries. Where a substitute for rotten manure is required we have found bone dust and soot very suitable.

In conclusion, I would mention that market growers are trying new kinds, and a few years will probably see more early and late kinds in cultivation. This, with fields in varying aspects, should add ten to fourteen days to the strawberry season, which is all too short at present. Many recent novelties are very large, but so soft and hollow that they travel badly, and are useless in a wet or moist season. Spraying with sulphur in early June will prevent mould in foliage and fruit.

CHAPTER XV.

RHUBARB.

This is grown to a great extent near London, and is a paying crop. The land should be good, and the soil deep. The black soil of market-garden grounds near the Thames, and the sea and its effluents seem to suit Rhubarb admirably. Now that it is used later in the season for wine and for jam, its culture may probably pay for extension. Early Rhubarb is to be recommended (preference being given to that of a good red colour), as when gooseberries make their appearance the price falls.

The forcing of Rhubarb for the London Markets is a great industry in Middlesex and some of the Northern towns.

1. Daw's Champion—This is far the best and earliest, and the stalks are of a rich colour, whether forced or in the open ground. Highly recommended.

2. Hawke's Champagne—A sturdy grower, starting early; of good flavour and rich colour.

3. Johnstone's St. Martin's, or Linnœus—Early, very fine flavour. Not so acid as many, and worthy of extensive cultivation.

Paragon is also a good early.

4. Victoria—A very strong growing kind, which comes in well after the others, and where it is sold by the ton, helps to make up weight.

The crowns are planted about 4-ft. apart, the land being previously heavily manured, and early in April some light litter is scattered over each stool.

CHAPTER XVI.

RED RASPBERRIES.

Where markets are at hand these are most profitable, as they require less attention than any other crop. As the picked fruit very readily ferments, it must be marketed as soon as possible after picking. Large sums have been made of this fruit; the seasons rendering it, however, a speculative crop—for if too wet, the fruit rots on the canes; while if dry, hundredweights are only found where tons were expected. On the other hand prices of course rule high in a scarce season, and a very fair average may be grown. Some sorts are favourites in certain localities, but dwarf kinds seem to be preferred, as they do not require stakes; but taller ones are most productive when bent over and tied.

1. Superlative—Is a kind that supersedes all others. We first distributed it in 1888. Fruit enormous, hardy, and of fine quality, with very stout canes; a continuous cropper. This now takes the first place for market sale, either in punnets or tubs. It makes the highest prices and produces three times more fruit than others, and succeeds everywhere we have supplied it.

2. Red Antwerp—Is one of the best; fruit large, sweet and firm.

3. Semper Fidelis—A fine late kind, finds favour with growers, as it cooks a bright colour; it ripens fourteen days after the others and produces heavily; but it grows up to 7-ft. tall, and must be planted widely apart.

4. Profusion—A sport from the Red Antwerp; fruit large, separating freely from the core.

There are now many varieties grown, but the above are the most reliable.

Hornet is finding much favour, as it weighs heavier than other kinds. Wisbech Perfection has bright carmine fruit.

White-fruited Raspberries may pay for local or punnet sale, the best are Large White, and Yellow Antwerp.

CHAPTER XVII.

EXTRA FRUITS.

We have now glanced at those market fruits most usually cultivated, but, before dismissing the subject, we would make some remarks on others that are grown less frequently, and which might in some cases be cultivated with profit. No one can see the laborious efforts of the vine growers on the Continent, with their miles of terraced hillsides where a lodgment is effected for their favourite fruit by sheer labour, without thinking that there are many wild places in England where not only Grapes, but Figs, and possibly Peaches could be grown in quantity in the open. In Devonshire and the South there are many wild places, where, with protection from winds, much useless rocky land could be utilized, and old disused quarries, gravel pits, and sand-holes be made luxuriant; while pond banks and damp situations could be planted with Quinces. These sell well, and a taste for them is growing. Quince marmalade is a very acceptable relish; and a few trees about the farm-yard and duck pond would not only be lovely in flower, but produce fine fruit.

1. GRAPES.—The White Sweetwater and Gamay Noir with the old Black Cluster and Brandt are generally very acceptable, and would be more so were they better cultivated and the bunches and berries thinned out. They would then ripen, and have larger berries. Reine Olga is also a fine out-door grape, with tawny

berries. Many old buildings and sheds are made picturesque by a covering of vines; and in the case of quarries, etc., they could, perhaps, be made to hang over the edges on wooden frames, if the soil was not sufficiently deep to plant them below; the large south or west gables of houses, barns, etc., could be filled with vines, and if the situation was very good, Miller's Burgundy and Black Hambro' could be tried, as well as the White Muscadine, Chasselas Vibert, Frontignan, and other hardy white Grapes. Under glass, if they can be well done, Grapes may pay, but the importation of fruit from the Channel Islands and the Continent has brought down the price of hot-house fruit produced in this country by one half; and further, so many gentlemen's gardeners have orders to sell their surplus crop, that the amateur has little chance of competing with them; though if the handy man about the garden, or, as sometimes happens, one of the family take a pleasure in looking after such things, they may be grown to advantage, but we should prefer to sell the crop at a price to a dealer, and let him take the risk. The high shop prices choice Grapes realize in our large cities and towns, and the low figure they make wholesale, is a most dismal outlook for growers just starting; and as those princes of culture, the market florists, have now taken up the growth of late Grapes by the acre, in their usual energetic manner, this matter must be thoroughly weighed before investing in "glass."

2. PEACHES, NECTARINES, AND APRICOTS.—These require so much care on walls, and the spring climate has for several years been so against them, that they cannot be recommended for open wall culture at a

profit; as when a crop is taken it may be general, and prices consequently low. We have found the large growing kinds, such as Dymond, Sea Eagle, Thos. Rivers, Barrington, and Princess of Wales, the best. Among Nectarines, Early Rivers, Cardinal, Lord Napier, Dryden, and Elruge, white fleshed, and Humboldt and Rivers' Orange, yellow fleshed, are the best. The Orchard House system of culture gives better results. Here with partial heat, or even without it, good crops are taken, and when water is abundant for syringing, they can be well grown. We would prefer, however, to have both Peaches and Nectarines trained flatly, 18 inches under the glass; and if attention is paid to thinning the shoots and fruit, wonderful examples are produced The best results are obtained from trees planted out, and the marvellous 18-oz. fruit grown at Bexley have astonished all growers; size and colour are two qualities to be aimed at. Remember always to send Peaches to market before they are fully ripe. (See Chapter on Packing). As before alluded to, we are inclined to think early Peaches might be grown on bushes in favourable spots, in the open air; especially where there is a mixture of chalk in the soil; probably, if for a few years trained to a sandstone bank or rock, and then allowed to grow naturally, merely thinning the boughs, a result might be obtained. The same remarks apply to Apricots, but the Orange and Breda only should be experimented on. Nothing is more injurious to these Stone Fruits than high cultivation in outside trees, as we generally get a wet time after the first growth is completed, and they then make fresh growth, which our short English summers prevent

from becoming ripe enough to resist the rigours of winter. Probably a covering, such as is used for vine borders, would obviate this, by throwing off excess of moisture from the roots. In all cases the soil must be firm, and no stimulants should be used till the fruit is set; always water very freely.

FIGS are like Tomatoes and Oysters, a taste for them has to be acquired, and when a person begins to like, becomes greedily fond of them. In many parts of Kent they grow well on Bushes or Standards, notably on the Ramsgate coast on the chalk, or land where there is but little depth of soil, and only require a partial thinning of the branches annually, while along the Southern and Western coasts of Britain they flourish and make trees. They delight in a dry corner; the hardiest are the Brown Turkey and Marseilles, but Osborn's Prolific and others might be tried. The Brunswick gives very large fruits, up to ¾-lb., but it is a shy bearer. When Fig trees are heavily cropped, a free use of liquid manure in a dry season will assist the fruit into size. As in most large gardens a fig-house is now the rule, there will probably soon be a demand for a cheaper class of fruit; none is more acceptable on the breakfast table. Good Figs were making, wholesale, 12s. per dozen in May, in London.

A very interesting account of the Fig Orchards in Sussex appeared in the "Garden," May 10th, 1890, from which we extract the following notes:—"The best kind for open air culture is the Brown Turkey, and the trees are allowed to grow naturally without pruning, and among them is one said to have been planted by Thomas á Becket, which has barely

survived, being struck by lightning in 1885. They prefer a gravelly subsoil, and lime rubbish and similar materials are added as a dressing to the rich surface loam. Just before ripening, the Figs are placed into bags, to protect them from birds, otherwise they are sure to be spoiled. The larger trees have stakes and cross pieces to keep the boughs from the ground, and so greatly are they now appreciated that they sell for as much each as they formerly fetched per dozen." Chalk rubbish appears to form a good foundation for their roots to work in, and no doubt the introduction of broken bricks, stones, cinders, etc., would keep the trees from making too gross shoots, and enable them to ripen their wood.

MULBERRIES.—These are seldom seen in market, they so soon spoil after picking. So far as we know no use has yet been made of them as a preserve. They may become useful in dyeing, the stains being very intense.

BLACKBERRIES.—One of our most delicious fruits as a preserve—in fact, with cream, quite an exotic dish is produced; but these are generally suffered to grow wild. Many stony banks, probably the heaps of refuse from quarries, chalk works, lead works, etc., might be planted with them to advantage. The jam-maker who first had a stock would be able to command a large price, after the flavour became known. Blackberry jelly and jam have yielded good returns. They are also cultivated in Kent. The selected British one is very fine, but the American varieties have failed to succeed in this climate. The cut-leaved kind, or Parsley-leaved, is very productive and free in growth. Many sides of railways, roads, etc., would grow these

well. Can be propagated by cuttings made from the roots and long shoots.

THE LOGAN BERRY is a gain in this direction. It is a very free grower and it bears enormously, and can be cultivated where the Raspberry fails. It is best planted in rows, 8-ft. apart, the plants being set 15-ft. apart, to be trained on a trellis about 5-ft. tall. It throws up very stout shoots from the base of the stool, which should at first be tied to the lower part of the trellis, right and left, and as soon as the old canes have fruited, they must be cut away, when these new shoots should be trained to fill the trellis, being tied firmly with stout yarn, and about 1-ft. of the ends should be cut off.

Logan Berries are getting known in market, and make about 4d. a pound, and are among the best bottled fruit. The Cut-leaved Blackberry should be grown in the same way, and makes 3d. a pound.

QUINCES might be planted as before alluded to. Cheap trees of these as two year old cuttings could be at first planted, or half-standards. They require no pruning for some years; merely thin the branches. The best kinds are the Pear-shaped and Portugal, both large-fruited varieties.

MEDLARS.—We have sold trees of these for market. The large-fruited Dutch kind forms a flat-headed tree, and the Royal an upright tree; the former is the best for market. As the green fruit is quite uneatable, they could be planted in the hedgerows; and those who are expert could graft them on the whitethorn already there, but to save time they should be purchased from a nursery. They are marketed in quarter sieves and in punnets, are reputed to produce a fair return, and are becoming greatly sought after, both for dessert and jelly.

BILBERRIES, CRANBERRIES, AND WATERCRESSES are crops which those having especially suitable damp places could cultivate; and even the Heath could be grown for broom-making with advantage; but these matters are rather outside the range of the present little work.

TOMATOES are on the border-land between fruit and vegetables, and are a paying crop under glass culture. Many excellent manuals are to be had on this subject. Catch crops in the open are sometimes very lucrative—a friend made £40 from a quarter of an acre—but the disease has to be reckoned with, and a fine warm summer is indispensable; in cold years they prove a failure.

CHAPTER XVIII.

PURCHASE OF TREES.—PROPAGATION.

Pears, Apples, Plums, and Cherries may be purchased of any reliable nurseryman; and we may here say that we do not advise propagation by amateurs—for this reason—we never yet saw any home-grown trees equal to those produced by professionals; because there is a certain modus, which only experience can impart, often depending on very minute matters which a long treatise would scarcely give an amateur an idea of, and much dexterity of operation, and expert discrimination in choice of stocks is required—and this especially in the case of Plums, where there are seven or eight distinct stocks used. There is further the previous preparation and transplanting of stocks, that we at once pass over the subject of propagation in these fruits.

PROPAGATION—PRACTICAL FRUIT CHARTS.—During the author's Mastership of the Worshipful Company of Fruiterers, a set of five charts were prepared by his daughter from original sketches, showing the various operations of planting, pruning, budding, grafting, cutting, and layering. These charts with a handbook of plain directions were published by the Company for teaching Horticulture in our Elementary Schools and County Council centres, they will be found of the utmost value for beginners in Fruit Culture—demonstrating the various operations, as they do in such a practical form. They can be obtained

for 2/6 each chart (if one only) or the set of five for 6/- nett, with the handbook. They have been warmly welcomed by the County Council Lecturers and the Gardening Press. Purchasers have to pay carriage, the charts being of large size, mounted on card-board and eyeletted for hanging up, they are too large for post. They can be supplied from The Royal Nurseries, Maidstone.

In selecting trees, preference should be given to those having a clean bark and free growth; indications of healthy active roots; really one of the most important points. Much stress is sometimes laid on getting trees from a soil which is relatively poorer than the one about to be planted, but we have never seen Maidstone trees fail even in the poorest of soils, or as far north as Orkney or in the more genial counties of Devon or Cornwall. Our results are not produced so much by manure as by frequent hoeing, and cultivation of the soil, inducing roots to develop to a remarkable degree; and other nurserymen seem to work on very similar lines.*

If Standards or Half-standards of Pears, Apples, or Plums are required, they should be of an uniform height in the stem, and two to four year old trees should be preferred, as their roots are more at home, and young trees start more freely than those which are older and have to recover themselves before they can make progress. Many two years' feathered (unformed pyramids) are now planted; these can either be allowed to form Pyramids or Half-standards, as required, and are

* "I think it most important to buy good trees. Deal with a reliable firm and have the best. It may look a little expensive at first cost, but when one is spending freely on the land—and fruit planting entails spending freely if properly done—it is of the greatest importance to plant good trees, that one may rely upon to be true to name." *Year's Work.*

cheaper to purchase than trimmed trees. Such are eminently suitable for plantation work; the lower boughs are removed as the bush fruits planted among them rise in height, and extra strength is given to the stem of the tree if some side shoots are left on for a few years.

Dwarf trees may be either maidens or cut-backs, two years are preferred, and are of course the cheapest form of tree; but cheapness is only a relative expression, and is a matter which frequently leads the buyer astray, as some trees of the same age and description, *on paper*, are worth double the value of others, and a good tree is always the cheapest in the end. Although ill-grown trees may in careful hands be rocovered, they are better left alone. See that Plums have no split in the stem, and no gummy places, and that Cherries have no wounds in the stem, and are not too crowded in the head. Pears and Apples should be free from canker in the stems, and have that bright shining bark which betokens well ripened wood. On the other hand, if buyers deal direct with a respectable Nurseryman, who is a grower of these things, and one who has a reputation to maintain (and not a middle-man), they will be as well served as if they selected their trees.

Bush Fruits.—Currants and Gooseberries are so much alike in growth, that in purchasing it is better to specify a minimum number of shoots, or buy by sample at per 100, and ask the seller to have them tied up in small bundles (not too many in one). Raspberries are none the worse if only two feet high; fibrous roots being the great desideratum.

TRUE TO KIND.—A word as to getting trees true to name:—Nurserymen are but mortal, and when it is considered that many hundreds of varieties are grown, the wonder is that so few mistakes occur. If, when you go into a Nursery, you see the tallies or number pegs systematically arranged, you may be sure that the proprietors and foremen are careful people. Where the pegs are partly rotten, tumbled down, or illegible (which happens in soils that do not grow trees freely, and where they remain a long time on the ground), it would be a better plan to mark your trees while the leaf is on. Mistakes rarely occur in market trees, because they are grown in large quarters of a kind, but in garden sorts, where perhaps the foreman has not opportunities of selecting grafts, mistakes may be innocently propagated. Strawberries for market are readily selected, as purchasers can satisfy themselves by seeing them in fruit or foliage, or by asking for samples of plants.

PROPAGATION.—Now as to propagation of Bush fruits:—The stronger shoots left from pruning are selected and cut to the length of 6-in. in Black Currants, and 8 to 9-in. in Gooseberries and Red Currants, and where the latter are preferred on a leg or short stem, the eyes (buds) are removed at the base, leaving four or five at the top, and the cuttings are either inserted by pushing them into the soil, which has been previously prepared, or by making a trench, and laying them in regularly, 6-in. apart, taking care to have the earth at the base firmly trodden down; any spare corner of land can thus be utilized (if a little shaded, all the better), and success will in a great measure depend upon the season, a dry spring

being fatal. The cuttings require pushing down again if they lift from the expansion of the soil after a heavy frost; the surface soil should be kept open by using a small hoe between the rows to prevent undue evaporation. October and November are good months to begin, and in that case the cuttings can be selected before the bushes are finally pruned; after that time it is better to defer placing them till the winter frosts are over, though wet days, when the men cannot work on the land, may be utilized by making cuttings, the shoots having been previously taken off and laid in sand or light earth, the cuttings, after making, being returned to the soil, in rows (not in bundles, which get dry in the centre), until required. Where large plantations are grown, some bushes are always wanted for replacing, and if any surplus remains they can be sold. Raspberries are increased by lifting the canes that spawn up away from the main stool.

If any amateur wishes to try grafting and budding, it can be done either by purchasing a few stocks, which must have a year's growth in their quarters before they are fit to graft, but they can be budded in August, or by grafting on established trees, recollecting that old trees of Plums graft badly, and if such trees exist of sorts that are not required, they should preferably be cut back and budded on the young wood in August.

CHAPTER XIX.

PRICES OF MARKET TREES.

These vary in value from year to year, and as in other commodities, from relation of demand to supply. Plums are generally the least expensive. Standard Orchard Trees of all sorts range from £6 10s. to £8 per 100, or from 18s. to £1 1s. per dozen. Half-standards from £4 to £6 per 100. Two years feathered from £3 15s. to £5. One to three year Dwarfs from £3 to £5. Bushes or Pyramids from £4 to £10 per 100, the latter often being the cheapest, as they are large fruiting trees, 4 to 6 years old. Two-year-old Bushes of Apples on Paradise stocks or Pears on Quince stocks are the favourite ages for market planting. The prices of Wall trees and others may be found in Nursery Catalogues. One-year-old or maiden trees are not recommended, they are cheaper, but the saving of time when older trees are purchased, outweighs the prime costs. Bush soft fruit ranges from 10s. to £1 5s. per 100; Currants being the cheapest. Sometimes these may be had of neighbours at a cheap rate; but these prices refer to Nurserymen's rates. Raspberries from 18s. to £2 per 1,000. Cob Nuts £1 10s. to £2 10s. per 100.

The best plan is to write to a Nurseryman, fully stating wants, asking for a price including delivery. Package is a sore point with buyers, as they object

to pay for this necessary but costly material. We advise all buyers to insist on proper packages, and in cases of trees in bundles—where not enough for a truck-load—have them matted as well. Where quantities of trees are sent in trucks, straw protection should be freely used, or bracken where it is plentiful. Purchasers should recollect that most Nurseries are near cities or towns, where such things as litter and straw are expensive, though of no great value to a country farmer.

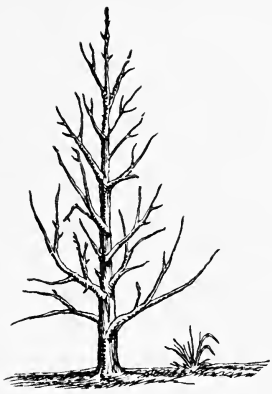
A few illustrations of Market Trees are given. The Standards of Kent have $5\frac{1}{2}$ to 6-ft. stems, and in Worcester and Hereford up to 5-ft. In the North and Midlands, the stems are $3\frac{1}{2}$ to $4\frac{1}{2}$-ft.

No. 1.—A Kent Standard Tree; the stem being 5 to 6-ft. long. Kent Half-standards are similar trees with the stem 4 to $4\frac{1}{2}$-ft.

No. 1.

Standards are generally used for grass orchards or for plantations as top trees.

No. 5 is a formed Fruiting Pyramidal Tree. In some Nurseries Nos. 8 to 11 are sold as such at a cheap rate; as these (2 years) have not been pruned or cut for the purpose, any observer will see that real "Pyramids" (as No. 5), which would be 4 or 5 years old, cannot be sold for the same price, and the former are found



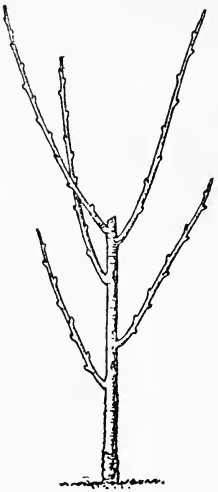
No. 5.

in practice after a few years to assume the letter V, instead of the proper form, like letter A, which is best adapted to catch all the sun's rays.

Bushes are preferable for plantations, and are trained the same shape as the illustration of Cob Nut (Chapter IV.), and are started in the shape of No. 7.

Apples on "Paradise," and Pears on "Quince," do not grow so freely as on other stocks, and can be planted at 12-ft. permanently.

In market culture, root pruning is not necessary.



No. 7

No. 8.

No. 9.

8 and 9 are Apples, 2 years unpruned, called feathered trees, and are given to show how varied is

the growth; 7 is a 2 years Apple on Paradise, cut back to form a basin like bush, the form in which thousands are now planted, to train in open bush or free pyramidal form; 8, Cox's Orange; 9, Worcester Pearmain. By removing the lower branches after a year's growth they also serve for Half-standards. 10 and 11 are Plums of two years old.

No. 10.

No. 11.

No. 12.

Damsons generally bush out freely. These 2-year Plums are often planted in exposed situations, as they are not so affected by the winds as Standards, the lower branches can be removed as the under fruit (Gooseberries and Currants) rise in height; the side branches of all trees may be left on for a few years, as they assist in forming a stout body to the tree.

No. 12 is a Gooseberry without a leg. This form of market tree is preferred by many growers, as the bush can be renewed if any branches break off.

CHAPTER XX.

PACKAGE OF FRUIT FOR SALE.

GRADING FRUIT.—This matter should have most careful attention from growers, as it is of vital importance. All kinds of hard fruit pay well for sorting, and when graded and marketed as firsts, seconds, and thirds, will make frequently 50 per cent. more than the same fruit sent to market unsorted.

In large growths it would pay producers to register a special "brand" name on a distinctly colored paper, and thus secure a reputation for quality and honest packing. The printing of the paper after the first cost of a wood block would be a small charge, and a half sheet could be placed on the surface after the usual packing paper had been bent over the top of the basket, something in this style:—

The corners being turned into the basket rim.

When a reputation has once been built up for high quality, it not unfrequently happens that the produce is all booked, even before it reaches the markets, at a price considerably above the rates of the day.

The packing and grading of Apples is a matter of the most serious import for the future of the British Fruit Trade. Success or failure rests largely upon the capability of growers to adapt themselves to the more modern methods of marketing, and the realization that the *growing* of the fruit is but one-third of the battle, and the infinitely more difficult question of *selling* must be met and overcome. A bushel of bad fruit costs more to pick, and as much to market as an equal quantity of first-class sample. Packing in branded boxes would enable a reputation to be built up and secure a new opening for sale, namely, that of the wholesale grocers, who will be only too glad to buy English fruit if packed in a manner that they can handle. The packing must be attractive, the fruit uniform in quality and size, and the grower who fulfils these conditions should, in a few years, be able to deal direct with the wholesale grocers, thus saving the intermediate profits which now press so hardly upon him.

The Author was much interested in inspecting an Institution called the Hereford Co-operative Fruit Grading Company, Limited, it has been now in operation for two years, and is increasing in favour with growers. All fruit is sold by weight and is well packed and branded as A1 or qualities 1-2-3. This work is done by women, and the cost appears about 3/- per cwt. to the growers, who must be subscribers of 5/- a year, and are bound to deliver their entire produce. This fruit is all box packed.

One grower who makes a speciality of choice Apples (Cox's Orange) finds a ready sale for them in boxes holding 18, 24, or 36, which are sold at the same price, and average about five pounds in weight, the 18 being the finest selected fruit. This culture can even be undertaken by private people, ladies or gentlemen, as a paying hobby, and no doubt our large growers will also take up such a profitable system of sale, as in that way they can realise double or treble the market value of bushel packages. See previous remarks as to cross fertilization, page 9.

A new and improved card-board punnet has been patented; its chief value consists in its having a little wire handle, so that on opening the cases, which hold 12 or more punnets, the fruit can be got at easily without handling.

It is the custom to pack all hard fruit for Covent Garden, or other London Markets, in baskets called "halves" (half-sieves), which hold, nominally, four gallons. Large Apples should be put into sieves, but dessert kinds sell better in "halves." * "I should like to give a warning against the practice of putting large cooking apples in half-sieves. This is very generally done, but is by no means a good plan. A 'half' of large Apples does not contain more than three or four layers, and in the packing, loading, and general knocking about the basket gets before reaching its final destination, the bottom layer becomes bruised, while the top layer suffers in the same way from the pressure of packing sticks, or possibly from the gentle railway porter's hob-nail boots when he is dancing on the baskets to make them fit into the railway truck.

* From *Year's Work.*

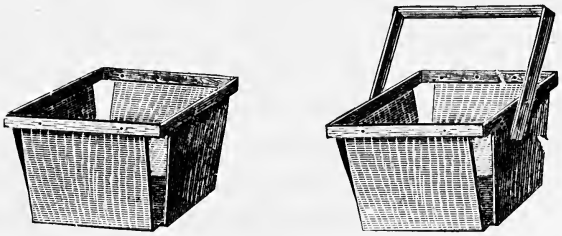
The result is that there is only one, or at most, two layers, that arrive at their destination in good order. If the same fruit were packed in bushel or cwt. barrels, the bruising is necessarily much less, and thus sells better. Dessert Apples are best packed in half-sieves, or in boxes."

Soft fruit for London Markets must of necessity be sent in baskets, as they give some air; in boxes such fruit would heat in transit. They are made up to a regular weight thus:—24-lb. Currants; 24-lb. Gooseberries, if ripe, 20-lb ; special very early green berries are best marketed in pecks of 12-lb.; Cherries and Plums, 24-lb.; the baskets being extra weight. In other counties they are sold by the "pot," and by other methods. A "half" is a circular flat basket, 10 inches high, and 13 inches over inside. In packing all soft fruit a cheap paper is used, called "Fruit Paper," (Double Smallhand), costing, wholesale, 1/6 to 3/- per ream for "whitey-brown," and 3/9 for blue paper; but newspapers can be utilized. The sides of the basket and the base are lined with paper, and half a sheet projects over the sides sufficiently to allow the two ends to lie over one another when turned back, to screen the top fruit and keep it clean; some litter, either pea haulm, rough hay, straw, or mixed litter from field sides, is then placed over the paper, the whole secured by two sticks, pointed at the ends, which are stuck into the upper rounds of the baskets below the rim in the form of a cross; these sticks rise a little above the level of the fruit, and protect it from the weight of other baskets, while the bottom of the "half" being rather hollow, they pack firmly one on the other. It is the opinion of many growers

that cheap wooden boxes, not returnable, must eventually come into use. This plan was approved at the Fruit Conference, but the smaller buyers (costers, etc.) cling to the old custom.

In making up soft fruits care should be taken to pick out the leaves, also that the samples are made fairly even, as if a quantity of one growth is "pitched" in the market, and the buyer happens to open baskets below the sample, the average value of the lot is lowered at once. Any bruised and speckled Plums should be thrown out, special care should be taken in packing Apples and Pears; to make the bulk as even as possible, it pays to exclude all inferior examples. Cherries are packed in the same way as small fruit, very choice or early fruit being sent in quarter-sieves (pecks). In the case of Morellos, they sell best in small shallow boxes, two layers only being placed in each, and the nett weight of the fruit should be put inside each box on a piece of paper. All salesmen will supply baskets and boxes, and this mode is recommended, as the loss, if growers find their own, is heavy; there seems to be no recovering any that are once missed. Care must be taken to get a large number ready before picking commences, and to keep up a home supply, otherwise picking may be delayed for a day or two in a critical time. Strawberries are, when large, packed in flat or upright chip punnets, holding ½-lb. or 1-lb, which the salesmen supply at a cheap rate (5/- to 8/- per gross). If the punnets are lined with fresh strawberry leaves, it gives the fruit a better appearance. The "King" Strawberries—the first extra sized fruit make good prices in punnets of 12 fruits, and later on baskets of four and six pounds,

with handles, are much sought after. The new chip fruit baskets are finding favour, and are very cheap. (*See illustration*). Refer to Chapter XIV. for fuller Strawberry information.



The Patent Chip Punnets.

These can be purchased wholesale of Messrs. Osman and Co., 132, Commercial Street, London, E.C., or through any seedsman; also suitable crates to hold 24 or 48 pound baskets.

Main crop Strawberries are picked with stalks, in baskets made for the purpose, with tops bending over, called "rim pecks," in the form of a gallon stone bottle, which hold 12-lb.; and in this case they are not covered with paper. Later on they are sent with or without stalks to the "boilers," in barrels holding about 56-lb. It is important to throw out any mis-shaped or unripe fruit, as appearance is everything in punnet Strawberries. The punnets before alluded to are again packed in large square hampers, or flat boxes with handles, secured from depredation. Choice Apples, Pears, or Plums pay to market in peck baskets or boxes, when there is a short crop.

Raspberries are "tubbed," special tubs being made for them, to weigh about a quarter cwt. Women pick the fruit, slipping it off the cores into small wooden or galvanized pails, which must be kept clean. Fruit

pickers earn from 1/- to 1/9 per day, and even more where they are paid by the punnet, but the better plan with small growths is to pay by day work, pickers then take more pains in gathering. Extra fine Raspberries, especially "Superlative," pay handsomely in flat punnets of ½-lb. or 1-lb. each; lined with leaves neatly before the fruit is placed in them. In the case of Raspberries and Strawberries, the baskets are all brought to a central lodge, where the foreman, after weighing, gives a tin ticket for every measure brought in. Orchard fruit is gathered by men and women; Nuts by both; soft fruit by both, and children. When Apples are sold by the ton for jam pulp, they are sometimes sent in American oil-cake casks, or flour barrels, and also in sacks. Care should always be taken to send good weight, avoiding the annoyance of "shorts" and loss of price, which is out of all proportion to the possible value of the tare deducted. Nuts used to be sold by the 100-lb., but now they are sold by the cwt. or ton. They are sent up in sieves (8 gallons), or, when harvested, in bags, they are sold in the husks (not shelled out). The following, taken from the *Gardeners' Chronicle*, will be useful:—

PACKING PEACHES AND NECTARINES.—Mr. Coleman says "I will now lay down a few rules to be observed by beginners. Always have a good store of dry moss in stock, the best and cheapest of all packing materials. (Soft wood wool is now generally substituted for moss). If properly beaten and prepared, it is soft, elastic, and never heats in the boxes. Avoid the use of bran, as it has a tendency to sink in bulk when shaken on the journey; the Peaches become loose, and as a

matter of course, separate from the packing, and arrive in a bruised and worthless condition. Never use wadding (the worst of all packing materials for soft perishable fruit), as it absorbs moisture, becomes hard, and heats on the journey. Avoid large boxes; those 24-in. by 14-in., and 4-in. deep inside measure, are suitable for 20 to 24 fine fruit. Always have the lids in one piece, nail slightly, and cord two or more boxes together. Place the direction label, printed "Fruit with care," on the top—"To be met at the terminus, this side up." I once heard of a porter who walked into a shop in the Central Row, Covent Garden, carrying a box with cards both on the top and sides. Puzzled by his instructions he informed the fruiterer that he had given each of the cards a turn upwards on his journey from the station, and hoped he had succeeded in carrying out the sender's directions. Gather fruit in very closely before the end of the week, and, unless specially ordered, never send away later than Friday morning. When Peaches appear sufficiently advanced for sending away, but yet their hold is too firm to admit of their being plucked from the tree without injury by the pressure of the fingers; take a piece of wadding in the left hand, with which the Peach is firmly grasped, then by using a pair of finely-pointed grape scissors with the right hand, they can be detached without bruising. Each fruit should be placed in a piece of tissue paper nine inches square, and be laid in a shallow box or flat basket containing a good bed of moss. When gathering (which should always be performed early in the morning) is finished, proceed to the packing room and prepare the boxes by lining the sides and ends

with paper, allowing the half of each sheet to hang over the sides for turning over the top when all is finished; then place a good layer of moss or soft wood wool evenly over the bottom, slightly tilt one end, and commence by folding the fruit in the squares of paper on which they are resting. Shake a little loose moss along the lower end of the box, and place the first Peach in one corner. Keep it in its place with the left hand, follow with more moss and fruit, never withdrawing the left hand until the box is full. Each Peach will then be resting in a soft nest, say an inch from the bottom, and about the same distance apart. Continue to introduce packing until every fruit is *quite firm* in its place, then turn back the paper over the whole, leaving room for half an inch of moss between the covering paper and the lid. Owing to the lightness of the lid, a little judgment will be needed in placing the last layer, as safety in transit depends upon the degree of tightness secured by pressing down the lid without bruising the fruit; nail slightly, and always cord well. In the case of large or long Peaches, lay them on their sides to prevent their tops being bruised.

PACKING GRAPES.—W. W. W. finds the best way to pack grapes for market is to place them in small baskets, holding from 8-lb. to 10-lb., first lining the basket with a little paper (no wood wool is required), then placing the bunches close together, their stalks being tied round the outside, and finally putting this basket into a larger one, known to salesmen as flats. This does away with the handling of fruit by salesmen, and consequently they are exposed for sale in the shop windows with as good a bloom as when cut from the

vine. They then realise much better prices, and the extra cost of carriage is very little.

GOOSEBERRIES now appear in the shops in upright punnets; giant fruits of Gooseberries are produced by liberal cultivation and by early thinning, and when well coloured in either red, white or green varieties, make good prices; they must not be too ripe. No doubt this extra care and labour is well repaid, and we feel sure that the railway station refreshment stalls would find it to their advantage to have small cardboard trays of fruit ready. Travellers do not care to pay 1/- or 2/6 for a basket of fruit of one kind, but they would, I imagine, pay 6d. or 1/- readily for a nice assortment of fruit in a handy paper or chip basket. Very neat paper pulp baskets can now be purchased at a low price in various sizes.

CHAPTER XXI.

STORING AND GATHERING.

This part of the fruit-grower's business is quite the most important operation in his yearly round, and yet it is one that is oftentimes, one may say generally, done in a slipshod way. Good fruit that has been allowed to hang on the trees and become well coloured and ripened will not stand being gathered in sack-pockets—as usual—to be afterwards ruthlessly shot out into a heap.

Forwarding Apples.—It is a good plan to gather a portion of one's growth of King Pippins, to heap them fairly thick to induce rapid colouring, and thus get them fit to market before the general run of "Kings" are ready. There is always a good opening for coloury examples of this Apple in October. An open lodge, or any temporary protection in the orchard serves as well for this purpose as a good building, as the fruit must all be sold before there is any risk of harm from frosts. It is not necessary to take such elaborate care of King Pippins gathered in this way for a rapid colouring as should be meted out to Wellingtons and Blenheims. They take less harm from the gathering sack process, and can be laid in a heap straight from the trees without being examined for maggoty and diseased specimens. Apples should be heaped thickly, say three or four feet in the centre, have no covering on the top in order to allow the heat "sweat" room to evaporate, have good roof

protection so that no rain injures them, and not too much air. In this way Apples will soon set up a rapid heat, and in about three weeks from the time of laying down will be ready for market, and will probably realise quite as much money per bushel as the later more carefully-handed gatherings. It should be quite understood that I do not advocate the foregoing method if fruit is meant to be stored for any length of time. Lammas, Chalk, Hessle, and early Pears can be forwarded in the same manner.

Gathering.—The sack or flap pockets so generally used should be discarded when gathering the best fruit, and a handled basket, such as is used for cherry picking be substituted; three gallons will be found a handy size. This basket must be lined with a piece of old sacking or some similar soft substance, and have a hook attached with which to hang it on the ladder, or a limb of the tree. The first fruits picked should be carefully placed by hand in the base of the basket, not dropped in, and throughout the whole operation the picker should take care his basket is never violently jolted about, or, in fact, nothing done to bruise the fruits. When full, the small baskets should be emptied into bushel or half-bushel sieves; the Apples being carefully run through the hands, not roughly shot into the sieves. With Wellingtons especially, every Apple should be separately handled in transferring them.

For conveying fruit to the main store, a spring van must be used; a little loose litter in the bottom will save bruising in transit. In the store a good bed of clean wheat straw—none other is good enough for the purpose—should be laid on the floor, care being taken

to put an extra thickness wherever there is the least sign of a draught that might admit frost later on. Everything depends on the next step. Sufficient pains are seldom taken to lay down the fruit properly. The prevailing practice is to bring the basket straight into the store and tip the Apples as gently as may be into a heap on the bed. This treatment is wrong. The proper way is to have women ready at the heap; the baskets should be brought to them and the fruit be handed out, every Apple being examined. The sound ones should be put in the main heap, and all faulty ones be laid in a separate place. This may seem costly, but it can be done for considerably under a penny a bushel, which choice fruit will repay in shillings. Treated in this way the minimum of waste is incurred, and the heap of sound fruit will keep much longer than if mixed as gathered, as one rotten fruit will spoil all those that touch it.

A dark place is best for storing Apples, the ground floor being preferable to one raised, although much excellent fruit has been laid upon the upper oast-house floors in Kent. For keeping till after Christmas the fruit must not be laid thickly, two to two-and-a-half feet being ample. The thicker the heap the sooner the sweating stage is reached; Apples cannot survive this process. On no account should the fruit be covered till one is compelled to protect it from frost. Wellington Apples are the most liable to take harm from careless handling, and at the same time they are one of the most valuable for February sale. But Bramley's and Newton Wonder, being more hardy trees, are fast superseding Wellingtons, as they cook as well.

Pears must be laid out on a floor singly, in this way they show when ripe for market. It is better to pack a week before they become quite fit.

Nuts.—It is essential to gather Cob Nuts in a dry condition. If wet when taken to the store the husks mildew and lose that bright bronzy colour so noticeable in a good sample, and are of course less saleable in consequence.

For the first week or so after being placed in store, Cob Nuts require constant watching to prevent heating. When laid too thickly, or if picked too green, they will be certain to heat. It can be easily ascertained whether heating has commenced by running the hand into the lump. If so, the nuts should be turned over and moved at once, and, if possible, spread over a larger surface. If once allowed to heat, all condition and colour in the husks is lost, and they lose weight also.

CHAPTER XXII.

PROBABLE PROFITS AND EXPENSES.

Regarding this important subject, it is best to strictly confine ourselves to facts. At the outset we must observe that a sober view should be taken of the matter, although fabulous prices are occasionally made, the seasons for two or three years may prove adverse, and actual loss may be incurred, which means that some loose capital is necessary. The most certain return is doubtless produced from a mixed plantation of Gooseberries, Currants, Raspberries, Plums and Apples, with part Pears and Cherries. After many notes taken on the subject, £25 to £30 per acre may be relied on as an average nett profit of a plantation of this kind when in full bearing; if Standards only on grass, about £10 to £15 per acre. In this case the grass is of course fed off by Sheep, and would probably pay rent without the fruit. Where soft Bush Fruit only is grown, the profits vary from £15 to £25 per acre, on an average crop. Where a large variety of fruit is planted, entire failure is very rare indeed; and as before stated, the average price when sold by auction is very regular, as higher prices in a scarce year compensate for deficient quantity.†

† Important Record Fruit Sale at Paddock Wood.—Mr. W. R. Tompsett held his 30th Annual Sale of hard fruit at the Railway Hotel, Paddock Wood, on August 9th, 1899, and there was a very large attendance, all London markets being represented, as well as local fruit merchants and buyers. The sale comprised excellent produce on 502 acres, consisting of Apples, Pears, Plums, Damsons, and Nuts. The lots embraced the young, extensive, and exceptionally well cultivated orchards belonging to Mr. Isaac Reader, whose fruit alone fetched no less a sum than £2,300, and then one splendid lot remained unsold, the reserve price not being realised. The total amount reached at this sale was about £7,000, and it is consequently a record and important one as concerning the fruit-growing world.—*Local Paper.*

In 1910, sixteen acres of Apples sold for £1,000, on the trees. The crop was short that season, but other orchards made good prices.

CHERRIES are a special crop in Kent, being mostly sold by auction on the trees when immature; an exact nett return can be given. In this case the seller takes the entire proceeds of the sale, less the Auctioneer's 5 per cent. commission. An average spread over many years give the returns of an established orchard at about £20 per acre. A young plantation at 48 trees to the acre, would, the first few years of bearing, make 2s. to 5s. per tree, and after that the produce would be greater year by year. An orchard of 24 acres, for which we supplied the trees, was sold at 20 years old for £300, which shows a good profit for capital invested; and this orchard will continue to improve for 30 years. In 1890, 42 acres on this farm sold for £630 with half a crop, and in after years up to £1,500.

Cherries from abroad are very inferior samples, and we need not fear competition in this fruit. Orchards in Worcester and Gloucester sell for a much larger sum. The average price of White and Black Cherries has risen considerably the past 20 years, and all who have suitable land would find them a profitable investment.

COBNUTS AND FILBERTS.—A ton or even more is occasionally grown per acre, but an average yield may be set at about 10 cwt.; lately 2 to 2½ tons have been grown in good years. Prices range from 3d. to 6d. per lb., according to supply. In some years 3/- per lb. has been reached. A crop gives about £15 per acre nett, allowing for Apples, etc., over them.

The best crops are obtained where they are not crowded by over-head trees, and as stated before, many stony banks, steep declivities, and poor hazel woodland would pay to plant with Kent Cob Nuts. In some years they pay best to send up in the green state, as there is a demand for the Ocean steamers, and they seldom come into competition with foreign nuts, except at Christmas time, before which season they should all be sold.

GOOSEBERRIES.—Where these succeed, as in the Fen district, where they reach the height of 5-ft., enormous crops are grown, and if the plantations are heavily manured in winter and even then further assisted in April with a top dressing (when the crop warrants the expense), the returns are enormous; taking an average, the nett profit appears to range from £20 to £25 per acre. Mr. Wright, in his Prize Essay, names 1/- as the produce of each tree; and the *Journal of Horticulture* says that one whole district gave a return of £70 to £100 per acre. During the season of 1890, as the Cherry and Plum crop were slack, the growers gathered green all the fruit at the base of the bushes, which was likely to be damaged by dirt washed up by storms, and at once surface-mulched their plantations, and brought off a crop of enormous ripe berries, which grew out to their utmost size; in this way the crop was trebled in bulk. Growers should always pick the bushes over three or four times. Where the mulching is done early, the bushes are capable of a full crop the following season.

BLACK CURRANTS.—In demand for jam, jelly, and lozenge making, and occasionally, from special reasons,

prices run up to unusual figure, as in 1882—25/- per bushel of 48-lb. The average yield is about 2 tons to the acre, aud the price from 5/- to 8/- per 24-lb.

RED CURRANTS are occasionally most productive; the average crop is set at 2 tons to the acre, say £21 nett per acre. A four acre plot produced in one instance nearly five tons to the acre; but as they are very susceptible to frost, and run off very freely in drought, the former estimate should be considered.

STRAWBERRIES are fully treated on in a previous chapter; occasionally they have been known to make £150 per acre.

RASPBERRIES.—We have not been able to get any details as to the average return per acre of these, but the price varies from £13 per ton. In some cases these are grown among other fruits, and therefore an approximate return only can be obtained; but in a plantation entirely of Raspberries, 1½ tons per acre would be fair average, and give a profit of £20 per acre.

APPLES.—Where an orchard is composed entirely of Apples, on grass, they rarely fail to produce a fair return, and occasionally a fortune. Near Ashford, one grower cleared £600 nett from 20 acres, and at another spot a grower sold his whole growth to a firm in the Midlands at 3/6 per bushel, merely put on the rails in the buyer's own baskets. In this case the crop was 6,000 bushels, being but a portion of the Fruit grown on the farm. We have in Chapter VI. dealt with a modern Apple plantation, and as the public taste is leaning to Apples in all forms, they are likely to remain a most sound investment. Authorities quote

about £15 as the average produce per acre. It is a matter worth noting that the price of Apples has steadily increased since more attention has been paid to their culture, the highest prices are realized for clean fruit from young and vigorous trees, and the improved sorts now available. These figures can be doubled where Dwarf trees on Paradise stock are planted 12-ft. apart.

PEARS would bulk rather more than Apples, when the orchard trees gained size, as they frequently crop very heavily, and from bushes on Quince double the profits of orchard grown fruit can be secured.

PLUMS generally sell well. In 1880 the Plum crop was generally large, yet very good prices were realized; though large quantities were sent from abroad, the importations had nearly come to an end before the English crop was ripe. The average price per bushel would be about 4/6 to 6/- nett, and the cultivation of Plums with Damsons may give rather a heavier yearly return, as they are more certain croppers, say £15 to £20 per acre.

FANCY PRICES.—In our own experience about this locality, some very heavy crops have been taken. The following are rather startling examples:—In Black Currants, near Rainham, the produce averaged a guinea a rod, or £160 per acre. We have ourselves grown a similar crop. In the West of England 2½ acres produced nine tons; 720-lb. of fruit have been gathered from one prune Damson in the same locality. Apples producing from 20 to 30 bushels each are not uncommon. The foregoing figures relate to orchards and plantations in full bearing.

EXPECTED PICKING.—When does fruit begin to pay? A freshly made mixed plantation would begin to produce the second year, and become remunerative by the fourth or fifth year; gradually increasing in value. An orchard of standard fruit would produce little until the fifth year, when it would begin to pay; but if on grass, in the meanwhile there would not be any direct loss; but we strongly advise that young orchards (except Cherries), should be raised in arable land, and the intermediate space cultivated, as before described (always avoiding grain crops) thus paying rent until the top crop is sufficiently advanced to allow the land to be laid into grass. One advantage of planting on grass should not be overlooked. During the apple and pear season we are frequently visited by heavy gales; the fruit, which is thus torn from the boughs, falling on grass is much less injured than in a plantation where it gets dirty and bruised; and in most years pays well for picking up, being marketed as "Drops." Prompt measures are necessary, as presuming others to have suffered from a similar cause, it is those who are first in the market that get the best price. While on this subject let us observe that it is not advisable to turn in horses and cattle when the ground is covered by fallen fruit leaves. Sometimes the heavy crops of Victoria and other large Plums may pay to thin and send up green, but a few should be sent up first to feel the market. All Apples and Pears pay well for thinning in the early stages of growth, and the "thinnings," if over the size of a racket ball, pay for the labour incurred.

Cost of Planting and Maintenance.—Much depends here on the kind of plantation or orchard laid down to fruit. In starting an orchard, there is only the holeing, planting, and staking to be done, consequently the cost can be readily calculated; the price of trees being included at £12 per acre for 48 trees, and in proportion for a larger number; but as previously stated, it would pay to trench the land, or cultivate it both ways by steam. If this were more attended to, complaints would not be so general as to trees standing still after a few years' satisfactory progress; few planters are aware how far the roots travel in search of suitable food.

The cost of preparing land for soft Bush Fruit or Strawberry culture is about £20 per acre; or, if trenched, £10 more.

The Capital required to carry on a Fruit Farm varies from £10 to £22 per acre.

Through the kindness of Mr. Cecil Hooper, who has gone into ways and means thoroughly in the Swanley district, I am enabled to give notes of cost, crop, etc., which may be useful to planters. The following Table gives concise information of approximate returns. The life of a Cherry tree is longer than Apples or Pears of the large growing kinds; and the author considers the life of dwarf Apples on Paradise stocks, Pears and Plums, will be quite as long as Standards, as trees in the Nurseries of 50 years old, Apples on Paradise and Quince stocks, are still vigorous and productive.

	Life of the Plant.	Commencement of remunerative return.	Period of best production.	Yield per acre.	Price per ton.	Gross return per acre.	Cost of First Planting per acre.
	Years.	Year.	Year.	Tons.	£ s. d.	£ s. d.	£
Strawberry....	4	2nd	3rd	2½ to 4	21 0 0	42 0 0	24
Raspberry	12	3rd	6th	2 to 3	28 0 0	70 0 0	20
Gooseberry....	12	3rd	7th	3	8 10 0	25 0 0	10
Red Currant...	15	3rd	7th	2	15 0 0	30 0 0	12
Black Currant..	15	3rd	7th	3 to 4	25 0 0	75 0 0	15
Plum (stand'rd)	40	6th	15th	5	16 0 0	80 0 0	16 to 25
Cherry ,,	100	8th	25th	4	15 0 0	60 0 0	
Apple ,,	75	5th	15th	5	10 0 0	50 0 0	
Pear ,,	100	12th	30th	2	10 0 0	20 0 0	
Apple (dwarf)..	50	3rd	12th	8	10 0 0	80 0 0	35 to 40
Pear ,,	50	5th	10th	5	10 0 0	50 0 0	
Plum ,,	50	5th	12th	7	16 0 0	112 0 0	
Morellos ,,	20	2nd	10th	3	24 0 0	72 0 0	

OMISSION.—In reference to cross-pollination of blossom, the importance of keeping Bees in fruit plantations was left out. Their honey also adds to their value as fertilizers.

P.S.—While this matter was in type, the Author was attending the great Fruit Conference at Hexham, Northumberland. Very interesting papers were read and discussed, and an arrangement has been made for our firm to supply the full reports, which will be of great service to planters in the Northern Counties and Scotland, at 1/1 each, post free.

CHAPTER XXIII.

DISEASES AND PESTS OF FRUIT TREES, ETC., AND THEIR REMEDIES.

In compiling these few notes upon some of the more common Plant Diseases, the Author wishes to emphasize the fact that, useful as he trusts they may prove to many, some knowledge of the conditions necessary to ensure health is far more important.

By way of preface, therefore, a few notes upon these subjects are appended:—

"Take care of the roots and the tree will take care of itself," will be a useful motto for all interested in Fruit Culture. However favourable the conditions may be above ground, it is useless to expect success if the soil is not in a healthy and suitably porous state for root growth.

Wounds of all kinds offer an easy entrance for spores, and should be *at once* smoothly pared down round the edges and painted with Blight Cure (No. 1). This will in Apples for example, prevent the spores of canker, and the American Blight (No. 1) from gaining a foothold from which it may be difficult to dislodge them. Winter spraying should be considered as quite an indispensable part of garden routine and will kill thousands of larvæ eggs, insects wintering under the crevices of the bark as well as fungus spores. It cannot be too strongly emphasized that cleanliness in culture is absolutely essential to the health of trees.

Rotting fruit on the ground, and dead twigs in the tree aid the spreading of disease, and the production of small weakly shoots, caused by over abundance of ill regulated growth in the tree, are a direct invitation to wandering spores to establish themselves as permanent residents. Before treating of the various diseases under the different species, we give a few notes and remedies for troubles which are common to all fruit trees.

A healthy tree will not be subject to serious diseases or insect pests which visit the strong and weak alike: upon the former they are but troublesome, but upon the latter, dangerous. Fungoid diseases are the most serious with which the cultivator has to deal, but they seldom attack vigorous-growing subjects. Cold winds, damp situations, cause a check to growth, and give the floating fungoid spores their chance, being always more or less prevalent in the air. If it is found impossible to remove the existing bad conditions of water-logged soil or position, remove the trees elsewhere or destroy them.

A yearly winter painting of all trees will destroy thousands of insects harbouring beneath the bark. This practice, coupled with healthy roots, should free the fruit growers from half the ills to which their trees are heir. Mr. Massee, the great authority on fungoid diseases, considers timely spraying should make these troubles impossible, as they are all amenable to treatment.

ANTS.—These are frequently very troublesome in Fruit Houses. If scalding water is placed in their holes copiously at intervals, it will kill them. If they cannot be got at in this way, beer and treacle set in

glazed flat saucers, with a piece of stick for them to run up, will kill them in thousands, and oil in phials is a safe remedy. We fear to recommend arsenic compounds on account of their dangerous nature.

GREEN FLY, APHIS OR WHITE LICE.—The Aphis are perhaps the most difficult pests with which the fruit grower has to deal, and in young trees the damage they cause is serious.

The recent work of Professor Theobald upon these insects establishes the fact that there are three principal species which infest the Apple.

The Permanent Apple Aphis, as its name implies, feeds entirely upon the Apple; the two other species, the Rose Aphis and the Blossom and Stem Aphis, migrate in the summer to other plants, returning to the Apple in late autumn. These Aphis are quite distinct from the species found on the Damson, Plum, Cherry, Currant, etc. In all these cases the eggs are laid on the wood in the autumn, and no wash is yet known which will *kill* these eggs. Remedies having lime as their basis succeed in sealing up the young in the egg, but not in killing them.

The vulnerable periods at which these insects may be best dealt with are when *they hatch out in April and May*. And again for the autumn brood, washing with soft soap and Quassia, Abol or McDougall's wash, should be undertaken the very first moment any insects are seen. The fact that there are but few should not lead the grower to consider it a slight attack, and unworthy of the expense of thorough washing. These "stem"-mothers and their progeny will increase by millions in an incredibly short time, and when the leaves curl up, the trees will

need four or five washings instead of one, if done at first spring sight of the insects, even repeated sprayings will not effect a complete cure owing to the great difficulty of spraying the fluid into the curled foliage.

The second vulnerable period is in the autumn. Owing to the migratory habit above referred to, it is often noticed that an orchard suffering severely may be in a few days entirely free, though no washing has been done. Growers must be on the watch in the autumn for the return of these Aphis for their egg laying. The leaves will not then be curled, and spraying at this time, especially in the case of the Apple Aphides, must be carried out with vigour. It must also be done in the case of non-migratory species, again in autumn, as the prevention of egg laying, which begins about September, will mean a clean orchard the following year.

Failure of Fruit Trees to Crop.—There are many reasons why trees fail to bear fruit, the principal of which are as follows:—When trees bloom, but set no fruit, spring frosts may be suspected, or an insect or fungoid attack may destroy the young fruit—see for Pears, the Midge; Apples, the Apple Sucker and Weevils; for Acid Cherries, the Brown Rot.

When no bloom is present, the failure may be due to lack of fruit buds through too strong a vegetative growth (see Root pruning), or to birds having, in winter, destroyed the buds. Plums and Gooseberries frequently fail from this cause, and the remedy is obvious. If the birds cannot be destroyed, lime-washing the trees may keep them off, and for low bushes, black thread spun from twig to twig will frighten them by entangling their feet and wings.

BIRDS.—The worst enemy among this tribe is the Bullfinch; his attention to the buds of Greengages and other good Plums, Apples, Pears and Gooseberries are to be guarded against. It is to be deplored that such beautiful birds must be shot, but that is the only way of checking their depredations, as they are bold to a degree. It has been suggested that they should be trapped, as they are very silly birds, and could be taken readily in a trap cage; they soon make tame pets, and a market can be found for them alive at about 3d. each; probably the bird stuffers would take them dead. He is also, with the Sparrow, a constant visitor to both Currant and Gooseberry bushes; and although lime and soot applied to the bushes when they are damp will check both, still the gun is to be used with care, as a bad shot will do more harm in a minute than the birds do in a week. As a rule the soft-billed summer birds—The Cuckoo, and especially Whitethroats, Blackcaps, Warblers, with our home-dwelling Hedge Sparrows, Tomtits, Thrushes, and Blackbirds do a great deal of good, and should not be annihilated, though their numbers have largely increased of late, because of the mild winters experienced, but all growers' men are seldom without a gun to keep them in bounds. It is very annoying to have fruit spoilt by Tits, or by larger birds, yet on the whole they do a vast amount of good, and were they destroyed entirely we should soon see an enormous growth of caterpillars and similar pests, as frequently reported from the Continent. It is a good plan to plant common Sunflowers in fruit gardens; many birds are then attracted from the fruit, as they richly enjoy the oily seeds. The Sparrow is troublesome at all times, and must be

ruthlessly destroyed in the egg or otherwise. It may be useful to give the summary of the report by Mr. J. H. Gurney, who, in conjunction with Colonel Russell, examined the contents of nearly seven hundred house Sparrows of various ages: "It may be said that about 75 per cent. of an adult Sparrow's food during its life is corn of some kind. The remaining 25 per cent. may be roughly divided as follows:—Seeds of weeds, 10 per cent.; green peas, 4 per cent.; beetles, 3 per cent.; caterpillars, 2 per cent.; insects which fly, 1 per cent.; other things, 5 per cent. In young Sparrows not more than 40 per cent. is corn; while about 40 per cent. consists of caterpillars, and 10 per cent. of small beetles."

SPARROW TRAPS.—We have caught great numbers in the traps of Messrs. Gilbertson & Page; we find best results (when near towns) if the trap is baited with sopped bread. In the country corn will answer better.

The Cherry is a very favourite fruit, and Fieldfares, Starlings, Missell Thrushes, Hawfinches, and other less common birds then make their appearance. We have found Clive's Scares (imitation tin Hawks) sold by the ironmongers very effective. They are suspended by a string, and if the eyes are punched out they appear to act better; but like other scares the birds get used to them if they remain in one place. They are most effective when suspended on a string from one tall tree to another, and can be shifted from place to place on the same string. The Cuckoo is a friend who should be thrice welcome; his attentions to the gooseberry caterpillar are most effective; he appears to be the only bird to tackle these loathsome sawfly

larvæ, and being a hungry bird he requires a quantity to make a dinner; therefore, if Cuckoos are noticed in the plantations, they should be encouraged, and the gun laid aside for a time. It is a beautiful sight to see a nest of long-tailed Tits, with the parent birds, flitting from tree to tree in the winter, examining every cavity, every loose piece of bark and cranny, for the pupæ of moths and the eggs of other insects; how regularly they work, and how cheerfully they flit from twig to twig. Not less to be encouraged are the other members of this family, the large and small Blue-tits, Tree Creepers, Nut Hatches, Whitethroats, Chiff-chaff, Garden Warblers, and Blackcaps are great scavengers in the summer season, and should *never be destroyed*, or their *eggs* taken. The Chaffinch is not mischievous, as far as we know. Starlings must be kept from the Cherries in summer, at other times they are useful. Rooks do much damage by settling on bushes and breaking young branches with their unwieldy bodies, especially among Gooseberries and young Plum trees.

FOWLS should be largely kept on Fruit Farms, and partially starved to make them voracious, and be tamed so that they follow the digging and pick out the insects and pupæ in the winter; and they will eat many millions of caterpillars, which can be dislodged by tapping the trees in summer, especially in Nut plantations. The stick used for this should be covered with sacking or carpet to prevent bruising the boughs.

SPRING FROSTS.—After a spell of fine warm weather during the blossoming season, a rapid change may take place on a shift of wind, and severe frosts play havoc with the blossom or embryo fruits. In

order to obviate this, the American and Canadian Orchadists have very successfully introduced smother fires, either made from the refuse prunings, weeds, etc., on the land, or better still, by the use of the Colorado Orchard Heaters, which give out more heat than a bonfire, are inexpensive to work, and can be quickly set going. The inventors say one man can light an acre in three minutes. They require no further attention, being self-feeding, and clean themselves. They burn for four hours with 15lb. of ordinary coal, this time being as a rule sufficient to ward off the fatal early morning frosts, but they can be charged with more coal to last double the time. In the bonfires the smoke spreads like a cloud, and thus raises the temperature and prevents the sun striking the blossom when frozen. An interesting trial took place at Hounslow. Fifty Colorado Heaters were started at about 25 feet apart, covering an acre of trees. The temperature was taken at 7-ft. from the ground, and from 6.20 to 10.20. The outside thermometer gave 32 degrees (freezing point), while the Heaters raised the area operated on to 35, 36 and 40 degrees, thus saving the crop. The cost of these Heaters is 2/- each for 100, and cheaper for quantities of 300—being at 1/6 each.

They have been tried by several large fruit growers with success, and there is no doubt that fruit crops have been saved by their use.

In smother fires the direction of the wind must be considered, and the annual prunings and weeds might be saved for the purpose of these bonfires, but if not used, we strongly recommend all rubbish and prunings to be burnt, as such rubbish only harbors insects and pests of all kinds.

MILDEW.—Apples, Pears and other fruit trees are liable to this in summer, and it appears as a white powdery substance upon the surface of leaves and shoots. Apples and Pears may be sprayed with Medela, No. 18, and this can also be used for Currants or Gooseberries, but Cherries, Peaches, Nectarines and Apricots should be sprayed with the copper carbonate as advised for shot hole fungus, which see. Mildew in Strawberries can be checked by the application of sulphur—this must be done early, before the fruit swells. In vineries the best method is sulphur wetted and rubbed on the pipes, sufficient heat being maintained to raise the fumes.

MOSS ON FRUIT TREES.—The presence of this shows a want of vitality in the trees. It can be readily got rid of by a winter dressing of unslaked lime and soot, also salt and water—2 ozs. to a gallon—and a mulching of stimulant manure to the soil will prevent its appearance again, and start fresh growth in the tree.

RABBITS AND HARES.—These are very destructive to the stems of young fruit trees, more especially Apples, and all trees must at once, on being planted, be protected by a covering of small-meshed galvanized wire netting—taking care to get it strong enough to keep out the sheep's noses—and secure it with wire. The best for that purpose is that called 17 guage, 1 in. or 1½ in. mesh. The protectors should be 9 in. or 1 foot wide, and 3 feet or more long, these are now made entire, and are much stronger than pieces cut from a roll of wire. Made separately, and galvanized *after* making, they cost about 4d. to 6d. each. They will last until the trees expand and take up the space. If two

stakes are used to a tree, the wire should be fastened to them. The wires should be sunk a few inches under the surface, and not to be less than 3 ft. high. The greatest injury is done in winter, when a fall of snow shuts off the rabbits' usual supply of food. Plantations of dwarf Apples and Pears should have the hedges wired round as well as the gates.

RED SPIDER.—All Fruit Trees seem liable to this pest, which makes itself evident by the foliage losing its green colour, and in Peaches and Nectarines assuming a greyish tinge. On Vines it can be cured by placing sulphur on the hot water pipes, and syringing the foliage freely with tepid water the next day, if the fruit is not too advanced. Trees in the open can be syringed with the compound named for Aphides, of various strengths, washing with tepid clear water afterwards. The spider attacks the underside of the foliage, and it is therefore necessary to keep the syringe low down, as unless the leaves are well saturated the minute insects escape. In dry spring weather, Gooseberries are often taken with it before the foliage is developed. Timely attention will save the crop, which would otherwise fall from want of nourishment. For Field Crops—4 lb. Liver of Sulphur, 4 lb. Soft Soap, to 100 gallons of water, is a good wash.

ROOT PRUNING.—The lack of proper balance between root and branch growth is the cause of strong barren shoots, and this vegetative vigour must be checked by lifting the tree in autumn or winter and cutting hard back all gross roots. Encouragement to the fibrous roots to keep on the surface is given by mulching of manure, but no Standard trees should be root pruned.

RATS may be trapped or killed by the new Virus, but Field Mice are not so easily taken; a good cat will make herself useful in the plantations. Foxes sometimes do damage also.

RUBBISH.—Always burn at once all prunings of Fruit Trees and Bushes, and the rubbish quarter and faggot stacks should be at some distance from the Fruit Trees, as they harbour all kinds of insect pests. A constant fire should be kept going to burn all fruit trimmings, hedge cuttings, etc.

SQUIRRELS are tiresome among Nuts. There is no remedy but shooting them, and although it may appear cruel thus to treat one of our most beautiful animals, they are most destructive, and travel miles from the fir-topped hills to the Cob and Filbert plantations, coming quite close to towns, although such shy animals.

WASPS do considerable harm among fruit. A liberal price should be paid for Queens in the spring and nests in the autumn, which can be readily destroyed by inserting rags, dipped in Cyanide of Potassium, in their entrances—it is a poison, and requires care in use.

WEEVILS.—When foliage or bark is eaten at the edges, or the young buds are eaten out, and no enemy appears by daylight, it is probable that trees are attacked by Weevils, which work at night. The trees should be quietly approached with a lantern, a white cloth be placed under them, then shake the Weevils gently into the cloth; collect and destroy them in *boiling water*. A small coppery day Weevil also does mischief, and should be similarly dealt with. It has been found efficacious to lay old sacking flat on the soil, stamped down; this being warm, the weevils lie in it, and from time to time it can be lifted, and the insects collected by shaking it.

WINTER DRESSING.—Should Fruit Trees be infested in Summer with insect pests of any sort, it is advisable that they should be carefully dressed, while leafless, with Gishurst Compound, or better still, our Blight Cure. This kills the hibernating insects and scale, cleans the bark, and promotes a healthy growth. In fact no garden should be without a can of it always at hand. The Caustic Soda remedy is very efficacious, and should be applied freely in severe cases. Great care is required, in application, to keep the wash from contact with the skin, eyes, mouth, and clothes, as it is very powerful and burning. (See 3.)

DISEASES OF APPLES.

AMERICAN BLIGHT *(Woolly Aphis)*.—This is very injurious to Apples, and makes itself known by a white woolly substance in the cracks of the bark and in the leaf axils, or wounds in the bark. It can be quickly got rid of on old trees, by rubbing in our Blight Cure (No. 1), which has proved of great value; this can also be used for syringing all kinds of Trees and Roses, for Aphis Blight. Colonel Lantour says—"I am pleased to tell you your American Blight Cure has been quite successful; after a third time, no more to be seen." We have found it also very effectual for cleaning Vines and Fruit Trees in winter. For slight attacks, vinegar or methylated spirit may be used. See also under Canker.

CANKER.—This fungus *(Nectria ditissima)* is unfortunately only too well known by the dying back of the bark in patches which often extend entirely round the branch and cause its death. The affected parts must be cut clean away and be at once dressed

with our Blight Cure, and fresh growth encouraged by a good surface mulch over the roots, and it can often be remedied by root pruning, and bringing the roots out of a cold subsoil. It cannot be too much emphasised that this fungus can only enter the tree through a wound, therefore all abrasions of the bark must at once be trimmed smooth and dressed with an antiseptic, such as Blight Cure (No. 1). Gunshot wounds, damage from ladders, and blows from the hoe or spade, make an opportunity which is seldom refused by this ubiquitous pest. See also Scab. As this fungus also attacks forest trees, such as Oak, Ash, Maple, Lime, etc., any affected trees near the fruit garden should be treated as above to minimise the risk of further infection. The Black Scab and Spot on fruit and foliage leads to Canker if unchecked.

CODLIN MOTH.—This troublesome insect lays its eggs upon the young Apples when about 1 inch long, and from the egg a small maggot bores its way into the core of the fruit, leaving its excreta at the eye of the Apple, which drops off prematurely. These drops must be cleared away at once and burnt to destroy the chrysalids. Dress the tree with Blight Cure during winter to kill any larvæ which may be hibernating there. Blue Tits and poultry do much good service by devouring the larvæ.

GOAT MOTH AND LEOPARD MOTH.—In the stems and branches of Fruit Trees a patch like sawdust may often be observed with a dripping of golden sap. This indicates that the caterpillars of the above are at work, eating their way into the pith of the Tree ; a twisted wire should be inserted, as far as possible, when the yellow larvæ may be withdrawn, and the

hole should be stopped up. The Moth lays its eggs in a likely spot, and on hatching, the young at once eat their way to the centre until they turn to chrysalids.

GREEN FLY (Aphis or Lice) on Plums, and the Red Fly on Pears and Apples, can be treated as for Black Fly at half the strength, or in the place of tobacco, 4oz. of quassia chips can be used with the soft soap. For Peaches and Nectarines the mixture requires well diluting, as the young growth is very tender, and two or three weak applications are preferable to one strong one, which will often bring off the foliage. It is best to do the work, if possible, in the evening, and syringe early next day with clear tepid water, to clean the foliage. Other Mixtures are Nos. 1, 2, 4, 5, 6, 7. A late brood of Aphis often appears in September; these should be carefully destroyed to prevent increase in early Spring.

SCALE.—When Trees of Apples and Pears appear to be greyish in the stems, this is caused by innumerable Mussel scale insects which adhere to the bark and quickly stop the healthy expansive growth of the tree. They may be checked by timely application of Blight Cure No. 1. Pears and Plums on walls are very liable to scale, also trees suffering from poverty of soil.

SCAB OR BLACK SPOT.—This disease (Fusicladium dendriticum), which shows itself in disfiguring brown spots and cracks on the fruit, and also as brown spots both on the leaves and the bark, is the most serious fungoid pest the Apple grower has to deal with. It is often disregarded until it has reached its most serious stage in which the young wood is covered with minute ruptures or pustules, and when

this occurs, strong measures must at once be taken if the tree is to be saved. The affected shoots must be cut off and burned, and the tree be thoroughly sprayed with Bordeaux Mixture, or more simply, a wash made of one pound Sulphate of Copper to 25 gallons of water. The surrounding trees and soil should also receive the spraying to destroy the resting spores. (See end of List). For the spots on leaves and fruits, spraying with Bordeaux Mixture when the fruits are just set, and again a week or two later will keep this down; but it is dangerous to spray when the fruit is full grown. There are many other fungi which cause spots on Apple leaves, but the above method applies to all. Root pruning as advised above under Canker, will be found effectual in many cases.

THE APPLE SUCKER (*Psylla Mali*).—This pest is very prevalent in some localities, and causes wide-spread damage to the blossom and occasionally young wood growth. A marked sign of its attack is the hanging of dead brown blossoms. The eggs of this aphis-like insect are laid in the autumn on the buds and in the crevices of the bark, from which they hatch out in April, and at once bore into the buds where they devour the young half-formed flowers. Cures recommended for *winter* treatment—Lime, 1½ cwt.; Salt, 40 lb.; Water, 100 gallons. Slake the lime in water, in which the salt has already been dissolved, and strain off through sacking or a fine sieve. The wash is then ready for use. It must be kept well stirred while being used. This wash has the effect of preventing the young larvæ from escaping by sealing them up while in the egg. To kill the

developed insect, a wash containing nicotine is much recommended, and could be used on a small scale; but its cost for extensive washings would be prohibitive. Action is being taken to get de-naturalised tobacco and nicotine at a cheap rate.

CATERPILLAR.—Moths which lay their eggs on Fruit Trees, and the Caterpillars of which feed in spring upon the young foliage, are of many kinds, and are known roughly as "Winter Moths." They may be divided into two classes, those with winged females, and those like bugs without wings. The winged class are hard to deal with. They may be attracted by light, and a bottle trap of sweet liquid or treacle and beer will catch very many. Owing to the difference in the time of their hatching out these methods are not very satisfactory, and it is usual to deal with them in the Caterpillar state with arsenical washes as detailed below. The wingless female class are easier to combat, as they are trapped by grease bands placed round the stem of the tree, which catch the females ascending to lay their eggs. The chief member of this class is the Winter Moth (Cheimatobia brumata); and the bands must be in working order for this pest by October 1st. Waterproofed paper of a tough nature is used, and a good grease (*see Chapman's advt.*) should be spread in a narrow band, say three inches wide, thickly rather than a wide thin layer. The bands must be constantly looked over, and if they are drying up, replenished with fresh material at once. The March Moth is the latest of this class, and the bands must therefore be kept going till mid-March, when this pest is prevalent. About mid-April the freshly-hatched Caterpillars may be found curled

up in the young foliage, when the arsenical spray must be used. A convenient formula is as follows:—

Arsenate of Soda (pure) ..	$3\frac{1}{2}$ ozs.
Acetate of Lead	7 „
Water	10 gallons.

Mix the Salts and dissolve in clear water, adding 1-lb. of treacle. Spray with a fine spray, and stop as soon the leaves drip. The preparation known as Swift's Paste is convenient, but our experiments lead us so far to prefer the home-made article. The paste requires merely mixing with water.

The extremely dangerous nature of this wash must be constantly impressed upon the workmen. No man with a small wound on his hands or elsewhere should be allowed to spray with it, and a wash with strong soap is necessary before the workman takes food, and its use should as far as possible be avoided, as an overdose continued many years may quite possibly kill the trees outright. All live stock and chicken must be excluded for two months from feeding beneath the arsenate sprayed trees, as many cases of death of sheep, etc., are reported from the dropping of the spray in grass orchards.

In view of these remarks, it is hardly necessary to reiterate the need for careful and constant attention to grease banding as being a safer and most efficient way of dealing with these pests.

Another good plan is to tie old sacking or straw round the tree, about two feet from the soil, in April. Many chrysalids will be found therein later, and the bands should be collected in October and burnt before the greasing is done.

CHERRY.

BROWN ROT OF CHERRIES.—This disease is rather prevalent in many districts, and is shown by a sudden withering of the young shoot just after flowering, and the presence of dead twigs in the tree. It attacks principally Kentish, Morello and Flemish Cherries, and is caused by the attack of a fungus, Monilia fructigena. The sudden death of the shoots is often attributed to frost, but a close examination will demonstrate the presence of fungus on the flowers in grey powdery masses. Remedy—Take out in autumn all dead wood and burn it, and spray in spring with Bordeaux Mixture, 1st—just before the flowers open, 2nd—directly the fruit is set. In pruning remove all whippy or sappy shoots.

BLACK FLY ON CHERRIES is very injurious, and should have attention as soon as the leaf shows curl and harbours any fly. If local, sprinkle with tobacco dust and syringe next day, and repeat again in three days time. If general, wash with 2 ozs. of strong tobacco steeped with 1 oz. of soft soap in 2 gallons of hot water, syringe well under the leaves in a warm state, or with Nos. 1, 2, 4, 5. If the growth is long enough, dipping is more effectual, and economizes the liquid, while sometimes the shoots affected can be removed entire.

CHERRY LEAF SCORCH (*Gnomonia erythrystoma*).—This disease is prevalent in many orchards, and is recognised by the affected leaves still hanging on the tree in winter, and presenting a black blotched appearance. These leaves serve to distribute the disease next season, so they should be gathered and

burnt, or the next crop will be affected. Spraying twice with Bordeaux Mixture in the spring is an effective remedy, 1st—before the flowers open, and 2nd—soon after they have fallen. In gardens where gathering of leaves is feasible, this will prove a sure prevention of its further appearance, as the spores remain only in the leaves, which must be burnt.

COB NUTS AND FILBERTS.

BIG BUD IN NUTS is caused by a mite very similar to that which attacks the Black Currant, and the treatment recommended for this should be tried for Nuts.

CURRANTS.

BIG BUD.—For this, the most serious disease of the Black Currant, there are now two methods of prevention, both of which have been practically tested, and have given completely satisfactory results. They all rest on the fact that as the buds open in March and April, the mites leave them and pass along the branch to the new buds forming in the axils of the leaves. This is then their vulnerable period. The methods proposed are as follows :—

No. 1. To spray with soft soap and quassia at the end of March, following it with two or more sprayings in April and one in May.

No. 2. To dust with unslacked lime and flowers of sulphur at the same times as recommended above.

FIG.

FIG DISEASE.—Shoots attacked with Phoma cinerascens, a fungus which attacks the bark, softens it, and ultimately kills it. The best plan is to cut off

the shoots as soon as they exhibit any signs of the disease (most evident in the autumn), cutting well below the part affected by fungus. Burning the shoots at this stage prevents spores being formed to scatter and attack fresh plants.

GOOSEBERRY.

GOOSEBERRY CATERPILLAR.—The presence of this pest is soon observed; when appearing in isolated spots the larvæ can be picked off by hand. If a large area is affected, a dusting with Hellebore powder will kill them at once, but as this is poison the fruit must be washed before use. A suggested remedy is to sprinkle fresh tan on the ground. The smell arising from this is said to stupefy the insects, which fall to the ground, and they can then be swept up. The tan must not be left on the ground when the fruit is picked, as it forms a nidus for fungi.

AMERICAN GOOSEBERRY MILDEW (*Spherotheca Mors Uvæ.*)—This disease has lately occupied much public attention, and it is without doubt in certain localities and under favourable conditions a serious pest. The felt-like spots on the shoots in winter caused by the adhering mycelium can only be seen by very close observation. If any brown spots are seen they should be teased with a pin, and if they are the true mildew it will come away from the bark, showing the light brown skin below. If it is only the result of injury it will not come away cleanly from the bark. These brown patches show in summer as white patches on the shoots and foliage which give them a silvery glistening appearance, an infallible sign of the presence of this disease. REMEDY—All affected parts should be at once cut off and burned, and the tree washed with Liver of

Sulphur, ½ oz. to 1 gallon of water. In bad attacks of this disease the shoots are much dwarfed and distorted, and the fruit occasionally covered with rusty patches. Preventative measures are as usual the best, and by keeping the trees well pruned, cutting out weak shoots and growing the trees in an open and dry position, the soil being well cultivated, the grower should keep clear of the disease altogether. It appears most generally where Gooseberries are grown under tall trees—which exclude the sun, and notably it appears during a wet time and muggy weather in September. As it appears on the points of the shoots, they can be cut off and burnt; but this is now a disease which has to be notified to local County Councils by law.

NECTARINES AND PEACHES.

APHIS.—See under Apple.

LEAF CURL OR BLISTER IN PEACHES AND NECTARINES.—This is caused by fungus, which appears when the young growth is checked by cold winds; the affected leaves should be removed and burnt. The twisted leaves form convenient nesting places for aphides, which should be kept down by the washes already named. On the return of warm weather the Trees will put forth healthy shoots, and every care should be taken to encourage the strong growths. Foliage under glass is aflected when cold draughts play on it, root pruning one side of the roots yearly checks it. We offer a certain remedy, called Medela (Latin "a cure"), invented by our Mr. F. Buss, which should first be used in February, then again when the buds swell, and again before the buds fully open (No. 18).

TESTIMONIALS.

HILDENBOROUGH.—"Your preparation has been most effectual. We sprayed our Trees all over with it and have not a blistered leaf, although previously we had several trees completely ruined by blister. Now all trees are completely cured and carry good crops. I also tried it on a Rose that is always mildewed, and so far it is free also."

CHEVENING, KENT.—"I am more than pleased with your Medela, as although I was only able to give the trees one dressing, all those on which I used it are making healthy growth, quite free from blister, while one tree in another position, which I quite overlooked, is a mass of blistered leaves. As our Peach and Nectarine trees have suffered from this disease for a number of years, I look on your Medela as a boon, and congratulate you on its discovery."

AND MANY OTHERS.

SCALE.—This occurs chiefly on Trees under glass, and should be treated with a solution as for Apples at half strength.

SHOT HOLE FUNGUS (*Cercospora circumcissa*).—This shows first as small round patches dotted over the leaves of a light yellow colour. The patches eventually drop out, leaving a small round hole with a red edge. It does but little harm beyond limiting the available leaf space, and can be easily treated by spraying with Ammoniaical Solution of Copper Carbonate just as the leaves are expanding, and repeating twice after. Bordeaux Mixture must not be used, as it will burn off the leaves. A wash of half-an-ounce of Sulphate of Potash to one gallon of water is said to cure this attack.

SILVER LEAF ATTACK ON PLUMS, PEACHES AND OTHER STONE FRUITS.—The leaves of affected Trees turn silvery green, and the branches die back. As trees become affected in both dry and damp soils, and in both rich nitrogenous and poor soils, it would not appear to arise from the roots. There is no remedy for this disease, which is caused by a physical separation between the upper and under cuticles of the leaf; affected Trees should be destroyed, and all tools used must be thoroughly cleaned, as it is said to be transferred from one subject to another by pruning. Our Nurseries are very free from it.

PEARS.

BLISTER ON LEAVES is caused by a minute but destructive mite, which in early spring attacks the young foliage, raising pustules in which they lay their eggs, when a second brood is soon developed. Medela (No. 18) will be found most efficient for this, and should be sprayed on twice in February and March before the leaves open.

PEAR FRUIT MIDGE.—This has increased considerably of late years. After the clusters of fruit have set some abnormally large pearlets will be observed; on cutting these open a colony of small white larvæ are noticed. The parent insect lays eggs in the blossom, and as the fruit develops they are safely enclosed. The only remedy is to pick off the affected fruit at an early stage, before the new larvæ escape, and burn them; if the surface soil beneath the trees is removed and burnt, it destroys the larvæ which harbour there, and Kainit has been recommended as a surface dressing at 4 ozs. to square yard on arable land, useless on grass.

CRACKED AND SPOTTED FRUITS, see Black Scab, under Apples. Pears are more liable to this when shaded by Trees, if planted too thickly, or if too crowded by branches.

SCAB.—See treatment as for this under Apple.

PEAR SLUG.—A small, slimy black slug-like insect which attacks Pear leaves and frequently those of the Cherry, Hawthorn, etc. Lime or Hellebore dusted on the leaves by means of a sulphurator is recommended, choosing the early morning when the leaves are wet.

RASPBERRY.

BEETLE (*Byfurus tomentosus*).—This beetle attacks the fruits when in the larval stage, and causes the fruit to become deformed and shrivelled. The diseased fruits should be gathered quite early when only half developed, and burned, and the beetles can be caught upon tarred boards or be shaken into cloths when they are laying eggs on the flower buds in May. Vaporite might be dibbed into the soil, or Kainit dressed upon the surface to kill the young pupæ in the soil. The constant cultivation of the soil by exposing the larvæ to the weather, and attacks from birds will be of the utmost value. The Logan Berry also frequently suffers from this beetle.

STRAWBERRY.

This fruit is not troubled much by fungoid pests, and the shot hole fungus and rust can be dealt with as advised in Peaches and Nectarines; and mildew—by dusting with sulphur, an early dressing with soot or lime will check slugs.

HOW TO MAKE BORDEAUX MIXTURE.

This mixture, so invaluable for all fungoid diseases, has recently been the subject of chemical investigation, and one result has been that a much simplified method of preparation has been worked out, which greatly increases, on the one hand, its fungicidal properties, and on the other, entirely prevents the absence of those small particles of lime which formed when made in the old way, which were a source of trouble in the syringe and sprayers. To make 100 gallons take 6-lb. 6½-ozs. of pure crystallised copper sulphate, and dissolve it in a wooden or earthenware tub containing two or three gallons of water. It should be suspended in a rough bag or sack to assist rapid dissolution; then take some 5-lb. of good quick chalk lime, slake it with a little water, and put it into a tub containing 120 gallons of water. Stir two or three times, and leave it to settle till the water is quite clear. Now run off 86 gallons of the clear liquid, and mix it thoroughly with the copper sulphate as made above. The mixture must now be tested. Place a few drops of potassium ferrocyanide in a white saucer, and drop into this some of the clear liquid obtained after the Bordeaux Mixture has been allowed to settle. Any red or brown coloration indicates that there is copper in solution, and a little more lime water must then be added to the mixture, and the test repeated until no change of colour is observed. But it cannot be too much emphasised that every extra gallon of lime water added beyond that necessary means so much loss of efficiency. This method of preparing Bordeaux Mixture makes a slightly stronger wash than the old method, and to

make it to the proper strength, after testing, the quantity should be made up to 100 gallons with water, *i.e.*, 14 gallons. A ready-made powder, "Vermorite," which only requires dissolving in water, and which makes an efficient Bordeaux Mixture, can be supplied. In the recent spraying discussion at the Royal Horticultural Society's Hall, much emphasis was laid on the Bordeaux Mixture being prepared on the spot and under careful supervision—any carelessness of proportion or staleness of the mixture tends to make it useless. We recommend also Voss' preparations (*see advt.*), and "Woburn Paste," see No. 6a, which is ready for immediate use. To clean the hands after using Bordeaux, add a little vinegar to the water.

List of Insecticides Sold by G. B. & Co., Ltd.

		s.	d.
1	Bunyard's Safe Cure for American Blight on Apple Trees (*Woolly Aphis; A. Lanigera*).—This pest has from old Orchards found its way into private gardens. It requires care to eradicate; hitherto the remedies have often been as harmful as the disease, paraffin, etc., eating into the Trees and causing death to young examples. The above is a perfect and effective remedy. We offer it in bottles with a brush to apply the same, 10d. and 1/4, or post free, 1/4 and 1/10, and confidently recommend it to all growers. It is poisonous, and care must be used in storing and applying it. The cure is useful for Aphis and all other Insect Blights, but it requires to be diluted according to directions. ½-gallon tins, 3/0; 1 gallon tins 5/0; and 5 gallon drums	17	6

		s.	d.
2	McDougall's Garden Insecticide.—An efficient wash for spraying Fruit Trees and for Aphis .. .. .. pints, 1/0; quarts	1	9
3	Campbell's Caustic Wash.—For winter dressing Fruit Trees, Moss, Insects and Eggs. In cans, 9d., sufficient to make 10 gallons of liquid .. .. larger, 3/0 and	5	6
	This is very powerful, and requires care in application, as it spoils clothes, and is dangerous on the hands, eyes and face. Rubber Gloves for use when applying the same .. .. per pair	7	6
4	White's Abol.—Non-poisonous but absolutely destructive to Mould or Mildew, Red Spider, Aphis or Fly, Caterpillars, Jumpers, etc., and every form of insect injurious to plants. In cans—pints, 1/6; quarts, 2/6; ½-gallons, 4/0; gallons, 7/6; 3 gallons	18	0
5	Quassia Chips, add 4 ounces to a gallon of hot water for Green Fly, Plant Aphides, etc.; add a little soft soap, and dip the plants if possible .. .. ..per lb.	0	6
6	Nicotine Soap, a safe remedy for Mealy Bug, Scale, etc. .. .. .. jars, 1/0 and	2	6
6*a*	Woburn Bordeaux Paste, a convenient form, ready for use 5-lb., 4/-; 10-lb.,	7	0
7	Gishurst's Compound for Winter dressing Trees, and for killing Aphides, Scale, Thrip, and American Blight In boxes, 1/- and	3	0
7*a*	The "XL All" preparations.—The law now allows us to sell them under restrictions. The Insecticide cures and kills all pests. 1 pt., 2/0; 1 qt., 3/6; 4-gallon drum..	40	0
	This can be diluted free. See directions.		
8	Beetlecute, for destroying Beetles, Cockroaches and Ants .. per tin, 6d., 1/0 and	2	6

		s.	d.
9	Campbell's Patent Sulphur Vaporiser.—An apparatus designed to vaporise Sulphur in Greenhouses, to kill Red Spider and fungoid diseases affecting Roses, Vines, Cucumbers, Tomatoes, Chrysanthemums, etc., without danger of the Sulphur taking fire, or disfigurement of Fruit or Foliage. No. 1, for Greenhouses up to 5,000 cubic feet, 10/0; No. 2, up to 10,000 cubic feet	16	0
10	Tobacco Rag, genuine, for fumigating 14-lb. at 1/3 per lb.; per lb.,	1	4
11	Tobacco Powder for Aphis on Peaches, etc. in tins, 1/0 and	2	6
12	Sulphur and Tobacco Dust Distributors, "Patent Duplex" .. each 2/0, 2/6 and	3	6
13	Sulphur, "Brown," for Winter dressing per lb.	0	8
14	—— "Yellow," for Hot Water Pipes, Red Spider, Mildew, etc. .. .. ..per lb.	0	8
15	Hellebore Powder, finely ground .. ,,	0	6
16	Banding Grease, specially prepared for the prevention of the Winter Moth on Fruit Trees per cwt., 25/0; 56-lb., 12/6; 28-lb., 7/6; 7-lb. 1 cwt. drums, 2/6; ½ cwt., 1/6; 28-lb., 9d. not returnable.	2	6
17	Grease-Proof Paper, for using with the Grease, 8-ins. deep, 1-lb.=90-ft. .. ..per lb.	0	8
18	Medela—a cure for curl in Peach and Nectarine foliage and mildew in Roses, in drums—½-gallon, 2/6; gallon, 5/0; 2-gallon,	8	0
19	Treelime, a capital remedy for Winter Moth, as it can be applied direct to the tree bark without injury, and remains sticky for a long time .. Drums, 10/0 and 18/0; casks,	30	0
20	Lead Arsenate for Spring Caterpillars		

Literature of Fruit Pests.

The Pamphlets issued by the Board of Agriculture are not even now well enough known to fruit growers, and we strongly recommend these handy leaflets on "Insects injurious to Fruit Trees, and Fungoid Pests," priced at 1d. each.

The Board of Trade issue special leaflets upon all fruit pests. They can be had free on application to the Secretary, Board of Agriculture, 4, Whitehall Place, London, S.W.

1 Black Currant Mite.
4 Caterpillars and Winter Moth.
12 Gooseberry Saw Fly. Gooseberry Mildew.
15 Apple Blossom Weevil.
16 Apple Sucker.
20 Magpie Moth.
25 Cockchafers.
26 Codlin Moth.
34 Woolly Aphis (American) Blight.
41 Red Spider.
53 Pear Midge.
56 Canker Fungus.
62 Pear Slug (Saw Fly).
69 Tent Caterpillars.
86 Brown Rot.
87 Fungoid Diseases.
107 Mussel Scale.

Silver Leaf of plum

For a thorough and detailed account of all Insect Pests, the recent volume published by Professor Theobald, "Insect Pests of Fruit," is an invaluable work, and deals in the most exhaustive way with all pests caused by insects. The price, £1 10s., may be considered high for a book, but it should rather be regarded as a fee paid for the *most expert advice obtainable* in this country, advice which is always available and given in the most practical form. This work has entirely superseded all previous books on this subject (*see advt.*).

Highly recommended also is the little work, "Fruit Trees and their Enemies," by Spencer Pickering and F. V. Theobald. Price 1/9, post free.

WORKS ON FRUIT CULTURE, AS SUPPLIED BY G. B. & CO., LTD., Post Free.

The Standard Book.—"The Fruit Garden."—This work contains about 400 illustrations, and practical information of every kind relating to Garden Fruit Culture, Insects, etc. By George Bunyard, V.M.H., and Owen Thomas, V.M.H. In one Volume. "The best and most important yet published." Reduced price now, 13/- nett.

Bunyard's Modern Fruit and Rose Culture, revised and enlarged. The set embraces:—Hints for the culture of Apricots, Peaches and Nectarines, Pears, Apples and Plums for Villa Gardens; Cordon and Candelabra Trees; Strawberries in the open, and for forcing; and the management of Orchard-house Trees, hints on Root-pruning, Rose Culture, etc.—1/6 post free.

Royal Horticultural Society's Rules for Judging Fruit, Vegetables and Flowers, 1/7.

Grapes and Vine Culture, by the late A. F. Barron. New Edition of this standard work, 5/6.

A Year's Work on a Kentish Fruit Farm.—A first-class practical work by a large grower, 6d. post free.

Fruits for Cottagers. — R.H.S. revised pamphlet, containing valuable and simple hints for culture, of profitable sorts, etc., each 2d., or six for 7d.

Profitable Fruit Growing, by J. Wright (the Prize Essay of the Fruiterers' Company), 6th edition, 1/2.

How to Make a Fruit Room on G. B. & Co.'s Plan, with two Photographs and full instructions, 2/6 post free.

Udale's Handy Book on Pruning, 1/4 post free; a good practical work. We agree with his ideas, except as to pruning the first year.

New Fruit Charts.

The Fruiterers' Company of London, of which our Mr. G. Bunyard was Master in 1906, have published a set of five charts illustrating Planting, Pruning, Budding, Grafting and Layering, which combined with a handbook for instructions, may be had free by rail for 6/0, beautifully got up and mounted on cardboard, purchasers paying cost of carriage. Favourably noticed by the Press. These charts were drawn by Miss Lorna Bunyard, supervised by Mr. George Bunyard, and slides can be supplied for Lantern Lectures at 10/0 a set. A large number have been sold for County Council and School Lectures.

Rose Culture.

National Rose Society's Descriptive Catalogue, 2/2; also Hints on Rose Culture, 1/2.

R. E. West's "How to Grow Exhibition Roses," 1/0.

Roses. "England's National Flower."—Mr. G. B. has written a practical little manual with descriptions of Roses, grouped in families for special purposes, illustrated by photographs taken specially for this work by Mr. E. A. Bunyard. It contains hints for culture, and will be specially valuable for Amateurs who are often at sea with a catalogue that contains hundreds of varieties. 3/9 post free. Favourably reviewed by all Papers.

Rev. A. Foster - Melliar's Book of the Rose.—"Practical, and a treat to read." 6/6.

HARDY TREES, &c.

Handbook of Hardy Trees, Flowering Shrubs, Conifers, and Evergreens.—160 Pages, 50 Illustrations; full of useful hints; with English and Latin names. By George Bunyard, V.M.H. Post free 3/9, of the Publishers, George Bunyard & Co, Ltd., Maidstone.

CHAPTER XXIV.

FRUIT GROWING IN THE FUTURE.

Extract from a Paper read by Mr. George Bunyard before the Society of Arts.

Without in any way venturing to prophecy, we have seen enough of the success attained by the best fruit growers to outline in some degree the probable course of commercial success in the future, for it is to the newly planted orchards, where the sorts are of the best for their special purposes, and where clean cultivation obtains, that we must look for our chief supplies in time to come. In America and Canada they consider 15 years the average life of a paying orchard; the trees are then destroyed, a fresh plantation being started to come into bearing order before the older one is destroyed. In this country 40 years may be considered as the outside limit of a Plum orchard, 50 for Apples, 60 for Pears, and 80 for Cherries, and by that time the available nutriment in the soil may be considered to be exhausted by the standing trees, though with liberal surface manuring they may continue fruitful for many more years. Apples, Pears and Cherries are the longest lived.

It will therefore be well, before that time expires, to provide other growths to replace orchards that are exhausted. This may appear to many a drastic proposal, but the stimulating manures now given tend to strong sappy growth, therefore I think I have not over stated the probable paying life of Trees. Again

the public is fast being educated to distinguish between good and inferior fruits, and growers will find their future profit to lie in producing examples of the finest sorts from young trees, preferably dwarf Apples on Paradise, or Pears on Quince Stocks.

At present, colour is the marked factor in Apples more than quality, red and yellow being chosen for dessert, and green and golden for kitchen sorts, and expert observers will notice that this excludes many of our best flavoured fruits, which being russety, or of a nondescript appearance, do not sell on the market boards, though where quality is asked for they cannot long remain unknown. We may look also to improved methods of packing to secure higher prices. Instead of the half-sieve (four gallons) and the sieve (bushel) baskets, choice fruit should be boxed and placed in punnets and suitable packages, so that on reaching its destination it need not be again handled in serving purchasers. Many advocate a non-returnable wooden box, such as is used for oranges. A start has been made with ripe Gooseberries, White Currants, and Raspberries in punnets, and good prices result. The best Strawberries are of course marketed in $\frac{1}{2}$-lb. and 1-lb reputed punnets. I think also that the use of artificial manures suitable for special soils and crops, must engage the attention of growers in the future. It is evident, that from the use of kainit, soot, fish guano, basic slag, and rich portable manures the fertility of the land must be increased and retained, while with such manures, the crop of weeds which so often follows the use of stable manure may be avoided. There is another way in which growers should copy American producers, and that is by

planting large bulks of one sort of either Plums, Apples, or Pears, but so intermixed that cross fertilization is provided for, so that day by day market buyers can make sure of a supply of the same article. The wisdom of this is seen in the fact that when a retailer gets an Apple that suits his customers, and they have taken a fancy to it, the supply is often gone; and he buys another sort, which has to be tried before the public will take to it freely; whereas if a salesman was able to say "I shall have this sort for 14 days or so," the retailer could better gauge his wants and suit his customers. This also applies to Plums, and in fact to all fruits. As I have before stated, all old and worn-out orchards must be destroyed, as their produce is so inferior that it causes the price of better class fruits to fall, for I feel confident, that with the vast quantity of improved sorts which the Nurserymen of the present time have distributed, there will soon be no paying market for inferior fruit. The fruit of the future again must be carefully gathered, evenly sorted, well stored, and honestly packed; those growers, whose character is known on the market, can always make the best prices, and any sharp practices in the way of mixing sorts and topping-up always recoil on the sender.

In reference to the storage of fruit. I exhibited photographs of our Allington fruit room, which has enabled Apples in fine condition to be set up the latter days of May. I do not pretend that such erections are necessary for market fruit growers, as in Kent we have ready-made rooms in the abundant hop oasts and stores of the county, and many contend that fruit marketed direct from the trees pays best;

but the same principle can be observed even in existing stores, which is—simply gather the fruit with care, store only perfect examples, keep the fruit in the dark, and never let the stores be too dry, or allow frost to enter. Cultivators must also test new and improved varieties, and when found to suit their soil, embark in them largely. Many will not plant less than 300 of any variety. I am not hopeful of the progress of evaporated (dried) and crystalised fruit in this country, nor do I think that apple rings are likely to pay the producer.

It must be remembered that the Prunes of the Continent are really partially dried and prepared on the trees, in consequence of greater sunshine; and in such drying experiments as I have witnessed, even our large Plums come out of the ordeal—to use a common expression—all skin and bone.

Growers, too, must look further afield for market outlets, and I feel that the system of sending such huge bulks to London markets, only to be transhipped to other cities and towns, is doomed. Our largest growers pack their fruit, to suit distant markets, in baskets, barrels, or cases, as the particular district affects, and send it direct from their local stations instead of to London first, and thus make the best prices. It is obvious to all that there is neither time nor space in the large London markets to deal with the vast quantity that is sent there in busy seasons.

These remarks, however, are in no way intended to disparage London markets or London salesmen who do their very best for clients; but the course indicated may save those gluts of produce in the London market, and prevent lowest prices. London will always be

well supplied, and can consume a vast quantity, but producers on either a large or small scale will find it pay best to send the finest only for London sale. It is manifestly unfair to send the best only to distant markets, and the inferior to London, because the carriage is less, for it is a known fact that (as a rule) London buyers always give higher prices for selected fruit than provincial markets can realise. There is a growing demand for fruit jellies, flavourings, temperance drinks, jams, preserved and bottled fruits, and further developments of these industries are to be looked for, not only in a trade sense, but in private families, as the process is now so simple with the new and improved automatic bottles. Already a large demand is springing up for English fruit in Canada and South Africa. I have not touched on the culture of fruit under glass, because it is not within the scope of this paper. The most prosperous branch of this culture is no doubt the growth of Peaches and Nectarines. But we yet require more time to know what effect the maintenance and repair of the comparatively flimsy glass structures of the market growers may amount to, before we can consider the matter tested to an issue. Tomato growing is really properly treated as a vegetable industry, though on the border land between a fruit and a vegetable.

It will be observed that I take an optimistic future view of the industry of fruit culture. Quite agreed. And I can go further, and say that no grower who has entered on the matter in a business way has ever failed to make a profit, naturally largest where most care is taken. Cases of failure are known, but they can be traced to a want of ordinary business acumen

and are often the result of following false leaders, or the development of a fad.

The Kent system of Tenure as between Landlord and Tenant.—The rule about Mid-Kent is for the landlord to pay for such permanent orchard trees as the tenant elects to plant. Some landlords also further allow a sum for planting and staking. Having first arranged with the agent or steward, the tenant is bound to plant, protect, and keep in order all such permanent trees. But if the tenant makes a plantation, he furnishes all the soft fruit bushes, Raspberry canes and plants necessary, at his own expense, and at the expiration of his tenancy he has no claim on the landlord for his outlay. This is a simple matter, and has worked well when the tenancy is 14 years or more; but if a tenant dies, or leaves before the expiration of his lease, the bushes are valued to the incoming tenant as tenant right; or the landlord pays for them, and gets the sum from the new tenant, or should he be unable to do so at once, an extra rent is charged to cover the landlord's outlay. The passing of the Market Gardeners' Act, 1895, placed tenants who have planted in the past on a firmer footing, as under it the outgoing tenant can claim compensation for his outlay (before 1895); which is assessed by valuation if tenant and landlord are unable to agree as to terms.

It frequently occurs that valuers' estimates* differ widely, and a third man, as arbitrator, has to be consulted. I think in all cases a proper understanding should be arrived at on entering into a tenancy, and from experience I believe nearly all landlords and

* See Mr. Cecil Hoopers's paper on "Some Principles in Valuing Fruit Plantations," published by "Country Gentleman's Association," 25, St. James' Street, London, S.W., 6d. post free.

agents are ready to meet the wishes of a tenant possessing capital and energy. In order, however, to guard against an unfair advantage being taken by an improving tenant, it is customary on many estates for the words "under no circumstances shall this tenancy be considered as a market garden" are inserted in most leases (under recent Acts this cannot now be done). In other cases where the tenant finds the trees and plants, it is not unusual for an agreement to be made whereby the tenant at the end of his term receives a capitalised sum equal to — years' purchase on the increased letting value of the holdings, to be then determined by agreement or valuation. In my opinion the Act would have been improved if a definite number of years had been fixed under which compensation could be claimed, as bush fruits are practically useless after 10 to 15 years, Plums begin to decline after 25 years, and Apples after 40 years; but under a 14 years' lease a tenant should have reaped his profit on all outlay, except perhaps on a Cherry orchard. Undoubtedly the best plan is for the tenant to be a freeholder.

TABLE OF WEIGHTS AND MEASURES FOR LONDON MARKETS.

In order to arrive at a better understanding as to weights and measures for the marketing of fruit, a Conference of the Potato and Fruit Trades' Association and the National Federation was held, and the following standard, uniform, nett weight packages, to be known as "The National Federation Standard Weights," was agreed to:—

	Pots.	½-Pots.	½-Sieves.	Pecks or Strikes.
Cherries	72-lb.	36-lb.	24-lb.	12-lb.
Plums (all kinds)	72 ,,	36 ,,	28 ,,	14 ,,
Currants (Black, Red or White)	—	—	24 ,,	12 ,,
Gooseberries..	—	—	28 ,,	14 ,,
Strawberries and Raspberries (Galls. and Chips 5-lb.)	—	—	—	12 ,,

Tomatoes (English and Channel Islands) Handle baskets, Chips and Strikes, 12-lb.; ½-Chips, 6-lb.

Apples and Pears must be sold by declared and guaranteed nett weight, owing to the various samples, kinds, qualities and packages.

Fruit NOT packed in the above uniform weights should be sold by ascertained nett weight, declared at time of sale.

Should the declared weight be questioned, the average weight of FIVE packages out of every 50 packages, or part of 50 packages, in each consignment should be taken, and should be considered the average weight of the consignment.

In case of dispute, the goods should be weighed, and weight certified by an independent authority, the person challenging the weight paying the weighing charge.

DISCUSSION.

Mr. W. W. BERRY said it had given him great pleasure to listen to this paper, and he might say that on this subject Mr. Bunyard was a prophet, not without honour, even in his own country, and the tenant farmers and landlords of Kent would always be grateful to him for the pioneer work he had done, for the

advice he had given, and for the indomitable perseverance with which he had carried out his experiments over many years. The question of selection and packing of fruit was all important. If he had 100 bushels of Apples, he would rather send off 60 per cent. of the best, even if he had to throw away the other 40 per cent., but that was not at all necessary. If you picked out the very best, say 20 per cent., and packed them carefully in boxes, and then took a further 40 or 50 per cent. and packed them carefully in baskets, the returns from these two sections would be greater than from the whole 100 bushels marketed in a careless way; there would be a saving in carriage, in packing, and in other ways, and you would still have 30 to 40 per cent. of sound fruit to deal with, which you could dispose of to the "smasher," as the jam maker or cider maker was termed, at a fairly remunerative price. The same thing would apply to every kind of fruit. Another improvement was the steam cultivation of the land, not only in clearing old woodlands, but even on some of the best land in Kent, where he would not think of planting fruit trees without first thoroughly ploughing it and stirring the subsoil by steam. He recently broke up 14 acres, first ploughing it 9 to 12 inches deep by steam, and then following the furrows with a powerful steel implement to break up the subsoil, being careful not to bring the subsoil to the top, but thoroughly breaking it up from 21 to 24 inches deep. The whole cost was not more than £2 per acre, if you hired the implements, and that was quite saved in the cost of planting. Artificial manure was another important point. Any farmer or fruit grower could now be supplied with exactly the

manure his land or crop required, and at a moderate price—either prepared bones, guano, or some of the phosphatic manures which had been referred to. One of the principal reasons for which he would recommend these things in preference to farm-yard manure, was the economy of application. Apart from the question of weeds, which was very serious, especially with manure from London, the expense of hauling 20 or 25 tons of farm-yard manure on to an acre of fruit land, first getting it to the plantation, and then spreading it amongst the fruit bushes, was enormous, whereas if you had a suitably-prepared manure, with the proper quantity of potash, phosphates, and ammonia, it would all go in a one-horse cart and be carried out and sown broadcast on the land for three or four shillings. On a large scale, that saving alone would mean a good living for the fruit grower. With regard to foreign competition, there had been complaints for 25 years, but he thought the time had come to admit that the British fruit grower was largely dependent on foreign and colonial produce. In the old days a small quantity of fruit could be sold during the season; there was a shop here and there, and fruit was very dear, and when any unusually large quantity was sent to market there was no one to distribute it. The season then only lasted three or four months, but now we had choice fruit all the year round. There were hundreds of shops, stores, and barrows—fruit was constantly put before the public, who were thus educated to the consumption of it, and insisted on having it, and thus the fruit grower was far better off than he would have been without foreign supplies. Reference had been made to the advantage

of fruit and hop growing in keeping labourers on the soil, which was a matter in which he took great interest. Things were looking up a little in every branch of agriculture, and they wanted more labourers than they did a few years ago, but they could not get them. They were often in great straits for men to do a little extra work which they knew would pay for doing. If you went away from the most prosperous districts, up into the hilly and barren parts, you will find only one in three, or one in six of the cottages occupied, but down where fruit and hops were grown, and near the towns, there was an enormous dearth of labour. Instead of getting the assistance they used to have from the hill country, when there was any extra work, they could not now find it. In the villages where fruit growing was carried on, there was work during the winter in pruning, manuring, digging, making new plantations, and so on, and he was paying £1,000 in wages now, where £100 was paid when he was young; and a cottage could not be got for love or money, though five miles away there were empty houses, because there was no work for the men to do. The Kent fruit industry, therefore, was a grand thing, and it must be the same in many other counties. Fruit was becoming more and more popular every day; it had never been overdone yet, except in 1886, when there was the biggest all-round crop of fruit ever known, while at that time the system of distribution had not developed in proportion. There might be a crop now three times as big as that, and it would all go to market, and the public would get the benefit of it. Enormous quantities of hot-house Grapes and Tomatoes were now produced in

this country. Mr. George Munro had given evidence before a Parliamentary Committee that in one year he had sold 700 tons of English-grown hot-house Grapes, in addition to those from the Channel Islands, and more than 1,000 tons of Tomatoes.

Mr. J. ASHBEE (Manager, Covent Garden Market) said it was perfectly true, as the last speaker had said, that it was much better to keep inferior fruit out of the market altogether, than to put it in with the better class. He had repeatedly seen the sale of good Apples entirely spoiled because certain growers thought that they could get the better of the public by putting inferior ones in with them. There were two distinct classes of buyers; the man who bought the best and gave the best prices, and the man who bought the worst and only paid the lowest price. If you sent a mixed lot, the good man would not look at it, and consequently the lower-class buyer must have it, and he would only take it at his own price, and thus the grower often did not realise the cost of carriage, simply through carelessness and stupidity in packing his goods. Foreign competition in fruit was like foreign competition in everything else—cereals, hay, straw, eggs, butter, cheese, or poultry. Foreign fruit could not be kept out of the market, and it answered a very useful purpose. No doubt, it had stimulated the public taste; the more fruit people ate, the more they liked it. He had often wondered what our forefathers did for fruit; the people, generally, could have had hardly any. He could remember the time when the only thing you could get in winter was an Orange. The Colonies were making great strides in this direction. Cape Colony had recently come to the

fore, and within a decade would be sending fruit here which would be a surprise to many people. But it would come in when English fruit was over. When English Grapes were finished, there would be a good opening for Grapes from the Cape. Men had gone to the Cape from California, who were laying down hundreds of acres of fruit land, and they would be sending thousands of packages before many years. But it would do no harm to English fruit, which was equal to anything in the world when well grown and properly sent to market.

Mr. E. D. TILL thanked Sir Owen Burne for his remarks on Mr. Bunyard's reference to cider-making, and he remembered that when Mr. Radcliffe-Cooke read a paper on cider before the Society, the Chairman, Sir W. T. Thiselton-Dyer, was also sympathetic on the same subject. He would like to state his own experience. In 1895 there was an abnormal crop of Apples in Kent, and he urged the Technical Education Committee of the Kent County Council to make experiments, with a view to instructing Kentish people as to cider-making. They declined, but as a glut crop is not too frequent, he urged two Scotchmen, farmers at Swanley, to get an expert from Hereford, erect a press, and as Apples were plentiful they made 5,000 gallons that season. In a "glut" year liquid storage is the best way of saving a crop and relieving a glutted market of fruit. Something like 40,000 gallons have been made at Swanley since that experiment, and it is commercially successful. There is no difficulty in selling it. It contains a low per-centage of alcohol, $2\frac{1}{2}$ and 3 per cent., and although cider from Kent fruit is different in character from that of

the West country, it is not deficient in fine quality and flavour. As to keeping properties, he had been lately drinking good cider, made in 1895-1896 from local fruit. In the Weald of Kent they have lost the true art of cider-making; they put sugar in it, which is a great mistake. The French were paying more and more attention to the manufacture of cider. Mr. Radcliffe-Cooke had said he knew nothing for agriculturists which offered such an unlimited and profitable field as cider-making. Mr. Cooke's advocacy of cider, and specially in the interests of his own county, Hereford, had led to his being called the "great De-*cider*-atum." He would like to say that Mr. Bunyard had not referred to poultry keeping in orchards, but he thought it was a valuable and profitable adjunct, and he might mention that the production of poultry and eggs was now equal in value to our British wheat crop, and still admitted of immense extension.

Mr. D. Louis said the washing of fruit trees with poisonous materials had been practised for the last 50 years, and it was constantly done in France and elsewhere, as well as in England. He did not know of any recorded case in which any accident had arisen therefrom. In connection with artificial manures, he was pleased to hear Mr. Berry's remarks; he had been advocating it in Kent for some years, both because it was more efficient, and on account of the saving in carriage. But these things were adjuncts, not substitutes entirely for farmyard manure, and it was necessary that the right material should be applied at the right time and in the right way, otherwise it might be injurious. He lately had an interesting example of that on some thin soil in South Kent, just

over the chalk. It had been dressed persistently with superphosphate, with very bad results; but when he saw the character of the vegetation he recognised that the soil was acid, and advised the use of basic phosphate. That was put down, and the result was an entire change in the appearance of the place.

Mr. BUNYARD, in reply, said he strongly recommended that all new orchards should be raised on arable land, excepting Cherries, for which he could not advise that course. It was true they did well under it, but if there came a severe frost—anything like 24° below freezing—the trees would be completely spoiled; and not only that, but where the ground was very well manured, the Cherry trees ran away altogether. He was called in to advise at a place in Gloucestershire, where they had manured the trees highly, and they made enormous growth, 6 feet in a year, but after a hard frost the trees were completely spoiled. To farm a good Cherry orchard, you must let it go on very slowly. With regard to renovation of old orchards, if you possessed good sorts, by all means go in for it, but it was useless to take the trouble if the variety of fruit was not good enough to pay for it.

CIDER AND PERRY are only made in Kent for home consumption; recently, however, as before named, a Company at Swanley, Kent, have started the industry; but in the Cider districts it appears that raw Cider sells readily at from 1/- to 1/4 per gallon. It may probably be worth while to use our better fruits, and make a first-class Cider. Messrs. Gaymer of Attleborough, Norfolk, we believe, have adopted this plan, and their Cider is very much liked. There is no doubt that the special Normandy Cider fruits, which are

practically free from acids, are the most suitable. This has been specially recognised by the National Cider Institute at Longashton, Bristol, and they have propagated a quantity of the best recognised varieties for distribution amongst the growers, and beyond this their expert analyses and reports on the local Apples and the Cider made from them. There is no reason why Somerset, Devonshire and Hereford should have the manufacture in their hands entirely. Cider is very wholesome, and is especially refreshing, and would to many constitutions be better than other drinkables at four to ten times the price. Through the exertions of Mr. Radcliffe-Cooke, M.P. for Hereford, a great impetus has been given to Cider making; and the Cider works of Messrs. Bulmer, of Hereford, are a notable example of well directed scientific knowledge, combined with commercial activity, and they well deserve the success attained.

CHAPTER XXV.

LABELLING TREES AND NAMING FRUIT.

Tallies attached to trees when first sent from a nursery are soon lost; and many forms of permanent labels are now in use. To our minds nothing is better than to make a plan of the plantation, and insert the names on the plan, as labels get loose and are lost; and on the other hand, the wire to which they are attached, unless very frequently shifted, cuts into the tree stems and forms a wound. On wall trees, we have seen a good label made of lead, which has the name in full punched on with steel letters; this is hung on the stems and secured by a gentle pressure, the lead bending with the growth of the tree. If labels like this were used, they could be hung on the stakes in the earlier stages of the tree, and attached to the branches afterwards. This labelling is most important where trial trees are planted; and if the name is in full, much loss of time is avoided, as in the case of numbers the reference books are not always at hand, nor can the managing man always be found when he is wanted. A plantation, properly named, has a double interest and value. We think an eyelet hole, similar to that used in a lace-up boot, could be let into the lead, and in that case it could be fastened to the stakes by a large-headed felt nail. The Imperishable Labels made by Pinches are decidedly the best, and are now in universal use.

Owing to neglect in keeping a record of sorts when plantations are first made, George Bunyard & Co. are inundated with specimens sent for naming. The Firm are quite willing to do their best, but as it entails much loss of time at a busy season, they ask that not more than a dozen sorts should be sent at one time, and they would esteem an enclosed fee of 1/-, which they hand to the Gardening Charities.

CHAPTER XXVI.

NOTES ON THE ROYAL HORTICULTURAL SOCIETY'S CONFERENCE ON FRUIT FARMING.

This was a very important gathering, held on October 10th to 12th, 1906, and much useful information was then brought out in the various papers read and discussed. We propose to touch on the principal points, and refer our readers to the Journal of the Society, Vol. 30, April, 1906, 3/6, for full details (Office, Vincent Square, Westminster, S.W.).

FOREIGN COMPETITION.—The Lecturers again emphasised the importance of growing the best varieties in quantity, careful grading and packing, and fancy box packing for choice fruits, in order to compete with imported fruit. The work of the Irish Department of Agriculture was outlined by Mr. Harper, and his recommendations are worth reading. They establish a system of grading which is indicated by letters A to C, and a standard of weight as against the accepted English measures—give full instructions as to gathering, packing, disposal, etc. The growers, retailers, and users have all benefited by the new system, and it is greatly to be wished that a more uniform practice could be enforced by law in our home fruit trade.

Other interesting points came up in the first day's meeting. Most able papers were given by Professor Theobald, of Wye College, on "Insect Pests," with very full details and lists of insecticides, and Mr. F.

Smith, who is reputed to be the best Kent fruit grower, also related his experience, and gave lists of remedies. Mr. Massie followed on the same subject, and Mr. Warburton gave an interesting sketch on "The Life History of the Black Currant Mite."

The subject of "Land Tenure" was dealt with by Mr. Cecil Hooper and others, and his paper is a valuable contribution to our knowledge on the subject, but too long to be properly dealt with here.

October 12th was occupied in the discussion of Railway Grievances. Taken as a whole, the remedies proposed are most reasonable, and it was argued that if the Owner's Risk Rate could be abolished, and a reasonable Company's Rate substituted, the fruit industry would be greatly helped.

The final meeting was devoted to a discussion upon the formation of Government Experimental Fruit Farms in various parts of the country. The author ventured to say that he did not see the need of such institutions, as the chief fruit tree nurseries in the kingdom already had their trial grounds, and were always willing to give every information to enquirers, and further, the Horticultural Press were doing a great work in advising the public on all matters relating to fruit culture, as well as the Fruiterers' Company and the County Council Lecturers.

We have merely touched on these subjects, and advise those interested to get the report, either from the Royal Horticultural Society, or by joining the Fruit Growers' Federation, when a copy will be supplied to them. The Secretary is Mr. A. Miskin, Royal Horticultural Hall, Vincent Square, Westminster, S.W.

The Departmental Committee of the Board of Agriculture has issued a voluminous report, which may be obtained from the Office, Whitehall, London, S.W., or, in a condensed form, from the Royal Horticultural Society, Vol. 29, Part 4, at 15/-.

Beyond the statistics of the fruit acreage in the different counties, the progress of the industry, the benefit of fruit on the national health and sobriety, the question of the industry being overdone was emphatically denied by many of the speakers, the increased employment provided by the growth of fruit, the raising of the tone of the labourers in fruit districts, in consequence of the intelligence necessary for success, a glance at the chief fruit districts, the differences and drawbacks, the still insufficient knowledge, notwithstanding the County Council Lectures, the many works on Pomology, and the efforts of the chief Society (the Royal Horticultural), land tenure, taxation grievances, railway troubles, foreign competition, the insufficient inspection of imported fruit, pulp and jam, the labour difficulty, distribution troubles, bird and insect ravages, bee keeping, in all, a comprehensive threshing out of the entire subject, can be found in the report, which all interested in fruit culture should study.

Following up this report, a very large gathering waited on Earl Carrington to urge the adoption of several pressing matters arising therefrom. Want of funds was naturally pleaded by the noble lord (then Minister of Agriculture), but he was impressed by the fact that the gathering represented no less than 20 very important Societies, and promised his attention and sympathy. The deputation was ably introduced

by Mr. A. Griffith Boscawen, who, as a native of Kent, and Chairman of the Departmental Committee, has rendered great service to the fruit industry.

In October, 1910, a most interesting and instructive Conference on Fruit Culture was held at Hexham, N.B. The papers read were most valuable for cultivators in the Northern Counties and Scotland. The Author was present and can give a very favourable report on the local fruit exhibited.

CHAPTER XXVII.

SUMMARY OF A YEAR'S WORKING ON A FRUIT FARM.

The following reminder may be of use to beginners. The several subjects are treated in the body of the book, and should be referred to for further information.

Skilled Labour.—We have found the better-class young agricultural hand, who takes an interest in Fruit culture, readily picks up the necessary knowledge; and as wages in the fruit districts are high for experienced men, we advise growers to raise up their own people; a slight advance on the wages of of the district will generally ensure good active men, and avoid local friction caused by importing "strangers."

The work to be done may vary from year to year—as the seasons are early or late—but taken generally, the operations come due about the specified time given.

JANUARY.—*Apples* that are in the store should be carefully looked over, and those that are not keeping well should be at once sorted over, and the sound fruit be marketed. Best prices will be made by sending regularly, rather than by saving up for a Saturday's market.

Work in the Plantations. — Get on with carting manure on the land for digging in. Complete the planting of all Bushes and Trees not already put in position, and stake and wire the Standards to protect from cattle, if in Orchards.

Winter Pruning can be done in mild weather on the *Top Crops*, deferring the cutting of Bush Fruits till last. Keep an eye on Bullfinches and Sparrows, and destroy all you can.

Hedges and Shelters.—Fill up gaps in hedges and wind-shelters. Poplars can be cut in to thicken the growth of the past summer shoots. Cob Nuts may be pruned this month. (See Chapter IV.)

FEBRUARY.—As Canadian and American Apples will now be arriving in large quantities, it will be well to market all fruit in store. Only send the best to distant markets, the "seconds" sell better to local buyers. At this season large kitchen Apples make good prices, as the American fruits do not cook well. Bramley's is now the favourite late Apple for cooking.

Orchards and Plantations.—The work is very similar to that of January, and digging should be completed as soon as possible. Towards the middle of the month, those large trees which are to be grafted, should be headed down, and the grafts to be put upon them should be procured, and be heeled in a shady place two thirds of their lengths below ground, in bundles of 30 to 40, properly labelled.

Cob Nuts will now be in blossom, and the long catkins will open and diffuse their pollen. It pays to go over them in dry weather, tapping them with a stick wrapped round with flannel to scatter this pollen more freely to induce fertility.

This is a good month to dress fruit trees for Pear Midge, Moth-eggs, etc., with Caustic Wash.

MARCH.—Newly-planted trees will now pay for a mulching on the surface of half-long litter, to prevent

the sun drying the surface and injuring the upper roots. It is best to hoe over the surface round the trees before applying this mulch.

Raspberries should now be cut back, and all winter-pruning be completed as soon as possible.

Orchards and Plantations.—By this month all digging and planting should be finished, and any new trees of Plums and Damsons, planted carefully before Christmas, may now be headed back. But all other trees should have a year's growth before they are pruned.

Insect Life will now be reviving, and all prunings, bark-scrapings, rubbish, and hedge-cuttings, etc., should be collected for burning.

New Strawberry Fields should be planted this month. Every care must be taken to get a good friable surface on the land (see Chapter XIV.)

Orchard Trees should again be greased to catch the spring species of moths that will now be hatching, and ascending the trees. It must be remembered that each female insect lays thousands of eggs. All the spraying apparatus should be overhauled and put in order, and materials for summer use should be procured, as when the first buds begin to swell spraying should be started.

Where the ground is rough, after the winter digging, a dry time should be chosen to set men in the plantations with Canterbury 3-prong hoes to knock over the clods, and to make a friable season, to prevent the soil drying too rapidly later on.

Gooseberry Plots should be examined, and if any of the early formed leaves appear rusty this is caused by red spider, and washing should be done at once,

taking care to keep the spray well under the bushes and leaves. These minute insects require a small pocket-lens to locate them. They spread and increase so rapidly that the earliest possible attention should be given them.

Towards the end of the month *Plum* and *Damson Trees* will be showing blossom, and Apples and Pears be opening their buds. Careful watching for insects will ensure timely washing. Newly hatched caterpillars are so much easier to kill than when older.

Grafting is best done in March; the younger trees should be first done, the old trees headed back in February, in which the flow of sap is less active, being left until the last.

APRIL.—Continue to wash all trees attacked by insects, especially curled up leaves in Plums and Cherries, or their extension growth will be crippled; if the points of the shoots can be spared, they may be cut off and burnt at once, with the aphides upon them.

If heavy rains have "caked" the surface of plantations, it will pay to break them up with the pony hoe, or by hand hoe labour. This will kill seedling weeds, render the after cultivation easier, and prevent that evaporation of moisture which goes on where land is hard and unmoved.

Fruits will now be blossoming all round, and great damage is often done by early frosts. These cannot be prevented; but smother-fires, so arranged that their smoke travels across the plantation, will often be of service. It is generally admitted that well cultivated orchards and plantations suffer less than "half done"

lands, because healthy and early leafage affords protection, and upright growing varieties, as a rule, suffer less than pendant sorts. Colorado orchard smokers are referred to elsewhere.

Weeds will now be growing, aided by April showers, and should be vigorously kept down.

The final hoeing of Strawberries, before the straw is put on, should be completed this month.

MAY.—*Gooseberries* will be the first crop to send to market in the third or last week of May. Fancy prices can be made by picking over the bushes and selecting the largest only. The next picking should be those berries that are near the ground, following with the outsides, and finishing with the centre of the bushes. If, however, prices are good, it may pay to clear the bushes at the second picking.

Should *Cherries* and *Plums* promise a short crop, a portion of the crop of Gooseberries may be left for selling in a ripe state. The red ones sell best.

Strawberries will want "strawing" early in the month. Barley straw answers the purpose, being cheap, but wheat straw is best. If done quite early, say mid-April, there is no objection to long straw dung from the stables, as the rain, sun and air purify it before the berries are ripe, and the manure stimulates growth.

Apple Blossom will now be abundant, and the Apple sucker fly grub may necessitate spraying, and a late crop of winter moth larvæ may also be in evidence; a thorough spraying, as soon as the petals of the blossoms fall, will be advisable in plantation that have been injured in the past year; the check to

growth caused by cold nights and frosts induces the growth of insect pests, and extra attention is required at this period.

Weeds must be kept down, and even where there are but few, the hoe will be of great service in keeping the surface tilth.

Towards the end of May, where trees are promising a heavy crop, a mulching of long fresh straw manure will help the roots to carry a crop to a good size. It is of little use close to the stems, and should be in a circle 6-ft. wide, at 3-ft. from the main stems to stimulate the feeding roots. Where established trees are on grass, liquid manure or well rotted dung are best.

Should Dry Weather set in, the soil round newly planted trees should be stirred and well pulverised, in case the soil may cake and crack, and some short manure on the surface afterwards will be helpful (if not already placed there). And if a spell of drought sets in, young trees that show signs of distress may be watered, giving each a full dose, as dribbles are worse than nothing.

Buds upon young stocks that make a growth of 9 inches from the stocks should now be tied to the stock for safety.

Grafts put on old trees last March will now require the bands to be loosened, and the pug or wax to be removed. A stick should be placed to tie the new growths to, to prevent winds blowing them out before they are well set on their stocks. This is specially needed when the grafts are on old trees that make vigorous growth; these young shoots may be shortened in August by removing 12 or 18 inches from the points to prevent their breaking out at the graft.

JUNE.—*Strawberries* will be coming to pick this month, and Chapter XIV. on them should be read. As with other fruits, care in picking and packing pays well; and above all things, a large supply of baskets must be previously got in hand.

Green Gooseberries will now be good, and should be sent to market regularly; not keeping back for a glut for Saturday's market.

The *Aphis Fly* in *Plums* and *Damsons* should be searched for in the early stages of attack, to check their increase, and where only on the tips of the shoots, dipping is economical. Zinc handbowls are useful for this work. The brown Aphis on Apple shoots should also be sprayed for, before the foliage curls.

Surface mulch the roots of those fruit trees which are carrying heavy crops, if not already done (see May).

A few early Cherries may be ready at the end of the month. They should not be sent until fairly coloured, and the same applies to early Red and Black Currants.

The Whitesmith, *Berry's Kent* and *Pale Gooseberries* should be marketed green, as they do not pay to sell ripe so well as red ones. Ripe berries must be sent to market before they are fully fit, or they may burst in transit, and cause a loss in value. They should be hard when gathered, even if half coloured.

Continue to hoe young Strawberry plantations set in March, and keep down the weeds.

JULY.—*The Main Crops of Strawberries* will be ready the early part of July; Red Currants and Blacks are also coming ready. "Reds" pay to send, even

before the bunches are all coloured, for tarts. But for jelly and jam making the fruit must be ripe. In packing, keep out all leaves, and pack full weight.

Raspberries will pay in punnets as soon as Strawberries begin to fail, as will good samples of ripe Gooseberries. Raspberries in tubs must be sent off as soon after gathering as possible, or they ferment in transit; by passenger trains would be best. Where fruit is picked by piecework, the pickers, in their hurry, are not careful to make an even sample, or take care to prevent smashing of currants, etc. It is best to pay by the day and well overlook the pickers. Slack hands need not be kept on. The fruit bottlers prefer to have Raspberries delivered in 1lb. punnets, as this soft fruit smashes in bulk, and when carefully picked it keeps whole in the bottles and sells better. Contracts for this delivery with the bottlers is advisable.

In the last weeks in July, some of the Early Cooking Apples will be growing out, and where the trees are heavily cropped, it will pay to thin out the largest fruits for market, even if the prices realised only pay for the labour, the trees benefit, and will be enabled to perfect the rest of their crop.

Hoe Young Strawberry Plantations for next year's crop, and keep the surface free from weeds and stones. The work of removing the straw from the old strawberry fields, and running the broadshare plough between the rows will be needed as soon as the fruit is all picked, and can be better done before the corn harvest work begins. The Strawberry runners are cut off at the same time. Keep down aphis blight as before.

AUGUST.—The fruits for Bank Holiday folk will be ripe Gooseberries, early Pears, and in early seasons a few Juneating and Gladstone Apples. Lammas and Chalk Pears, if gathered a week previously and heaped, will take on a little colour and ripeness, and thus sell better.

Continue to thin Apples where the trees need it. Early Dessert Apples should be coloured before they are marketed.

The Summer Pruning of Red Currants and removing of superfluous inner shoots of *Pear*, *Apple*, and *Plums* on trees planted 2 to 7 years will be very beneficial, useless shoots being cut back to four leaves, to let in sun and air to ripen the wood.

The Budding of Plums on young stock should be done the first week in August, following with *Pears* and concluding with *Apples*. In some districts, perhaps the stocks are fit even the last week in July.

Blights.—If aphis blight has been well attended to, there should be but little now left to be killed, but if hot dry weather sets in, the American woolly aphis blight on Apples should be attended to (see Chapter XXIII).

Rivers' Prolific and Czar Plums will now be coming on. It is a mistake to let them be fully ripe before they are sent to market. Now that soft fruits are past, early kitchen Apples are wanted for tarts, and they often pay to send before they are fully fit, and it helps the trees to go over them 3 or 4 times, especially those grown as bushes on the Paradise stock. In some years green fruits of Victoria Plums pay to market; any way, a few should be tried, as fully cropped trees are assisted by the thinning, and

are less liable to break down under the weight of the crop. Towards the end of the month other Plums will be coming ripe.

Cob Nut Bushes are benefitted by having the strong centre leading shoots broken back and left hanging, at the end of August, to plump up the buds below the break. It is better not to *cut* them.

If in consequence of the heavy manurings on young Strawberry fields, weeds still keep appearing, they must be kept down; also all coarse weeds in old plantations should be pulled.

SEPTEMBER.—*Pears* and *Apples* will be the main crops for market. Again we repeat the warning, only to send the best to market, selling the "seconds" locally. Pack honestly, and endeavour to get a name in your special market. Fine samples of *Williams*, *Dr. Guyot*, or other Pears pay to market in boxes.

The main crops of *Plums* and *Damsons* will be marketed this month. *Cob Nuts* and *Filberts* may now be gathered in a green state, and often pay well to sell in this condition; they should have the husks brown at the tips. A trial consignment is advised to test prices before the whole crop is gathered. Large green cooking Apples often sell well when Plums are past. It frequently happens at this season we get heavy gales which blow off Apples and Pears; it only pays to pick up the very best fruits for market at once, delay will often cause the seller a loss, as there may be a glut in the markets; a local sale may probably pay best.

Pruning.—Summer pruning (as in August) can still be continued; and even old trees where the crops are gathered should have their boughs and surplus

inner shoots removed. All dead leafless wood can be better seen and taken out while foliage is on the tree. Extra long shoots upon young trees may be shortened by removing 12 to 18 inches.

OCTOBER.—During this month *buyers who are thinking of planting* should visit the Nurseries and see the stock growing, as a much better idea of sorts, growth, and healthfulness can be formed, than when the trees are dormant; and in many cases fruiting trees can be seen, and also up-to-date kinds, which a planter would do well to plant in preference to some older sorts.

Apples like King of Pippins, Summer Golden Pippins, Colonel Vaughan, etc., that are stored for a short time to colour, may be gathered in (read Chapter XXI. on "Picking and Storing"). Later on Blenheim Orange and other sorts will be fit. Nearly all the market Pears will be fit to store this month.

Strawberries.—Where the land is properly prepared, they may be field-planted this month, and become sufficiently rooted to withstand frost lifting in the winter, but if not done in September, planting is better deferred until March. But purchasers should secure their plants now, as they may not be able to find them in March, because growers clear their beds.

The Snags or Stockends of Grafted or Budded Dwarf Trees may be cut off this month; they are easier to cut out when the sap is up, and the wound grows over a little before winter.

If time can be spared now, it will pay to go over the *Raspberry Plantations*, cut out the old canes that have fruited, and pull up useless, sappy canes to let in air and moisture to ripen the standing canes for the next season's crop; some tip the best canes back.

The Main Crop of Apples will now require gathering; but do not hurry the work, as the few fruits that first drop may be maggoty, and perfect maturity is needful when Apples are stored a long time. They should always be stored dry. If prices are fairly good, they may perhaps pay well to market from the tree; but Bramley's Seedling, Lord Derby, Newton Wonder, Wellington, will pay to lay in; while Cox's Orange, and choice desserts also will repay any extra trouble. Choice Pears must be laid singly. All stored fruit must be looked over on wet days, and all rotten examples removed before they spoil the sound fruit touching them.

The Main Crop of Nuts will now be ready to gather (see notes, Chapter XIII).

As before stated, when a *Developed Tree* has been cleared of fruit, the *Pruner* should at once attend to the thinning of the branches and spurs, and old trees are greatly benefitted by a dressing of kainit, 5-cwt. per acre. In the future, only best fruit will command a price. If this pruning is done now while the days are comparatively long, it will pay well for attention, and wounds heal somewhat before winter sets in.

Red and Black Currants may be pruned now, but *Gooseberries* will be better left till February, as the Bullfinches are apt to thin the buds too much where the trees are reduced by early pruning. Where *Big Bud* exists in Black Currants it can be plainly seen when the leaf falls, and the buds should all be carefully picked off and burnt straight away.

This is the month for the Hardy Fruit Shows, and they are most interesting; but the grower for market must be cautious, and not be led away by size, colour

and appearance only. Naturally growers put up the brightest and largest; these are not always the best for profit, and beginners would do better to visit the Nurseries, and see their stores, and stick to a comparatively few kinds for profitable sale.

All Land intended for Gooseberries and Currants should be thoroughly prepared and well manured, as these bushes may be planted the end of October or early in November.

Purchasers should now place their *Orders for Trees and Bushes* required for the coming season, and get wire netting, stakes, etc., ready to support and protect the trees when planted.

Greasing.—About the middle of October the perfect insects of the Winter Moth begin to appear, and grease banding should at once be carried out on orchard trees (see Chapter XXIII). The grease must be renewed monthly until March. See that grease banding is completed by November 5th.

NOVEMBER.—This is the chief planting month. Plums and Damsons are generally quite fit for removal by the first week in November; Pears the second; and Apples the second or third. In any case this depends on the weather, a dry October may prevent lifting; trees are apt to shrivel in transit if lifted too early. Full directions for planting are given in Chapter III. Plant only when the soil is friable; in wet times it is best to defer working, laying the trees by the heels, or well covering the roots with soil.

Plant Raspberry Canes and all Bush Fruit. Market fruit as it becomes fit in the stores. Cob Nuts sell best before Christmas.

DECEMBER.—Continue planting. Cut down old and useless trees in frosty weather, and prune over old established trees not attended to previously. In large Plantations it may be necessary to start pruning back young trees. It can be safely done, except in very frosty weather.

Collect manure for winter spreading, before the diggers enter the plantations. Early manuring is good for bush fruits and young trees, but for Orchards and Plantations of Apples, etc., February is the best time.

Winter Digging.—When done early the soil derives great benefit from the action of frost and air, but in heavily manured lands weeds are apt to become troublesome, so that many prefer to dig a little later.

Old Orchard Trees.—During the slack time in November and December, it pays to scrape the loose bark off old tree stems and branches before the usual lime-wash is put on. A cloth should be put under the trees, so that the scrapings can be collected for burning. The lime-wash will kill eggs and larvæ of many enemies, and make the bark smooth and healthy, Some soft-soap and soot may be stirred into the lime-wash, and it should be applied not only to the stems, but upon the principal limbs. *A Good Recipe* is, first slake fresh lime to a paste, and to every gallon of this add one pint of paraffin, ½lb. of salt, and 1lb. of soft-soap. The soap should be first dissolved in hot water and then added to the bulk, stirring all well together. Apply with a tar-brush on a long handle, or a white-wash brush. The salt and paraffin make the wash enter all interstices, and are distasteful to insects. If desired, some soot may be added, say a quart to 4 gallons of water.

It is a good plan to *Market all Apples* at least 14 days before Christmas, as at that time, foreign produce is preferred. About January 10th, demand again sets in for culinary and dessert Apples.

Frosty Weather should be taken advantage of to get manure out on the land, and thus avoid kneading the surface, and deep cart ruts that occur when the land is wet.

Rubbish of all kinds should be collected in frosty times and burnt, spreading the ashes among the manure heaps. Hedges can be repaired also. Finish re-tying trees to stakes. Old hay-bands should be removed and burnt, as many insects lodge in them, and the new tie to stake be made above or below the former tie.

GLOSSARY OF TECHNICAL TERMS FOR THE USE OF BEGINNERS.

Bagging Hook.—A Kentish term for a large kind of sickle.

Blight.—A general term for all insect attacks.

Bush Out.—A term used to denote lateral growth.

Cut Backs.—Dwarf trees headed back to 18 inches.

Fleet.—A Kentish term for shallow.

Fly.—A general term for aphis blight.

Lay In.—Trees placed in a trench, their roots being covered with soil to prevent their drying. Shoots for grafts also.

Maidens.—A nursery term for one year old trees.

Nurses.—Trees planted for protection, either Damsons or Chalk Pears in Orchards, or belts of quickly growing Poplar, Scotch Fir, Ash, Chestnut, and Larch Fir.

Punnet.—A chip basket of ½lb., 1lb., or 2lb. capacity.

Pug or Wax.—Materials used to exclude air in grafting.

Smother Fire.—Rough couch or other grass and rubbish, that smokes freely and burns slowly.

Snag.—In budding, a piece of the stock lies above the bud, and this has to be removed by an oblique cut. In grafts it is a shorter piece of the stock. Its removal allows the new growth to spread to the thickness of the parent stock.

Spawn.—Where the stock or plant throws up suckers from the roots.

Stool.—The mother plant.

Tilth.—The result of harrowing and rolling in farm crops, to produce a friable surface. A good tilth is land in a proper condition for planting or sowing (braid in Scotland).

Topped.—In pruning means the long shoots cut over and reduced in length. In packing fruit it refers to the reprehensible practice of placing the finest fruit on the surface layers of the package and inferior stuff below. It is wrong in principle and does not pay in practice.

NOTE.—In consequence of the number of Letters sent to the Author, asking for Addresses of Makers, Patentees, etc., of the Appliances recommended in this work,

ADVERTISEMENTS

have been inserted; therefore, to save trouble, enquirers will oblige by writing DIRECT TO THE VENDORS.

APPENDIX.

Extract from "The Journal of the Royal Horticultural Society," March, 1910,

On Pruning Fruit Trees after Planting,

BY PERMISSION OF THE WRITER,

J. Lansdell, F.R.H.S.

"The question of the pruning of fruit trees after planting is one in which I have taken great interest for many years.

After making experiments for several years, and closely observing what others have done, I have come to the conclusion set forth below as to the best time to prune newly planted trees.

I believe there is no doubt in the minds of gardeners that the best time to plant fruit trees is from the middle of October to the middle of November, because, by planting at that time, new roots may be formed before winter, and the soil gets so well settled down around them that the plants can start into growth in the spring, under almost equal conditions with those which have not been removed. Unfortunately, for various reasons, all planting cannot be done so early in the season.

If young trees such as our nurserymen are in the habit of sending out are planted at this time, I have no hesitation in saying that the pruning should be done the following spring just as the buds show some signs of moving, which with most trees is about the end of March. I would never prune in the autumn

or winter immediately after planting. The reason for deferring the pruning until spring is that one can then see whether the buds to which he is pruning are sound wood buds. Because trees which have been removed, however short a distance they may have travelled, are very liable to have some of the outer buds on the shoots broken or injured, so that they do not start into such active growth as to make good leading shoots for future branches.

Possibly, there may be some who do not attach so much importance to the leaf system on a newly planted tree as I do; but it appears to me that the more leaves a tree has, and the earlier in the season these are produced, the more active the root will be, and the balance of the tree will be restored much more quickly than in one which has but few leaves to commence with. An unpruned tree produces nearly all its leaves at the beginning of the season, and these can at once work for the good of the tree, and for the formation of roots.

I think it might be taken as a rule that, when a tree is dug up, and the roots pruned ready for planting, not more than one-third of the original roots remain, and that the balance between the roots and top had been disturbed to that extent. I, as a gardener, was taught to attempt to restore the balance by pruning the shoots back after planting, either immediately after planting, or in the spring before the leaves burst; and I believe this theory is generally taught to other young gardeners. But, I ask, why restore the balance? Would it not be better for the tree to restore its own balance? From my own experience it is much better for the tree to do so.

The part we want restored is the roots; and the tree will do this more effectively *if all the shoots are left unpruned the first season*, so as to give a greater amount of leaf surface early in the season. The roots formed under those conditions are fibrous, which is just the sort desired. I have found that trees which were left unpruned the first season had many more fibrous roots than those which were pruned the first season, when both were lifted and replanted two years after.

I think we can safely say the balance will be restored the first season; then if the shoots are all cut back to good wood buds, which will probably be within four or five inches of the base, good strong growths will be produced, which will lay the foundation for the future branches of the tree, and far stouter than those on trees pruned the first year of planting.

For the last ten years I have seen a great number of fruit trees planted in the Evesham district, and I should think quite nine-tenths of them have not been pruned until a year after planting. I have asked some of the growers to prune a few the first season for comparison, but in no case have the trees done so well as those not pruned until a year after planting. These men judge by results; and when they have once proved a system to be best, no amount of literature will turn them.

I have been looking at some Apple trees this week which were planted two years ago; some of them were planted in November, and the others in February, and all were pruned back in March of the same season. Those planted in November produced shoots

from four to six inches long in the first season; at the most, only two shoots came out from each shoot cut back, but they have made fairly good growths this year. Those planted in February, and pruned in March following, made scarcely any growth, and not one has made six inches of growth this season; they are only about a third of the size of those planted in the November previous. There are other trees of the same variety which were planted at the same times, and in the same field, but were left unpruned for a year; and the growths of these trees this year are far superior to the best of those pruned the first year after planting, and there is no doubt about them making the best trees; the owner says no one will ever persuade him to prune again until the trees have been planted a year.

The system of pruning I have advocated in this note has been practised for some years, and I have simply given some of the facts of my experience and observations with the hope it will be tried by others."

SUPPLEMENT to FRUIT FARMING.

A very interesting Conference was held at Wye College, Kent, December, 1910, and the following points were considered by the authorities worth notice:—

Great complaints were made as to the failure of Cox's Orange Apple to bear a satisfactory crop, possibly owing to the past cold seasons. Many growers were grubbing them out. This appears premature, as a cycle of good summers may cause them to do better. Others said good results had been attained by grafting Bramley's upon them, and that the restriction caused Bramley's to bear more or less fruit every season.

The packing of choice fruit in boxes was strongly advised, but only for choice dessert fruits, especially early varieties. It was agreed that too many sorts had a bad effect on market rates.

Local Societies, for the co-operation of growers to get lower carriage rates, was advised. In this way the small man would be on equal terms with the large growers.

Lord Derby, Lane's Prince Albert, Gladstone, and Beauty of Bath, were considered safe for all fruit districts; but Julian, Lord Grosvenor, Early Victoria, Stirling Castle, Bismarck, Newton Wonder, Worcester Pearmain, King Pippin, and Allington Pippin, were good in many parts. (Bramley's apparently has been left out by accident in the report; it should be well in the first series). In the less known Apples, Edward the 7th, Norfolk Beauty, Hunt's Early and

Hector Macdonald, were quoted as promising. Another big grower added to the above—Miller's Seedling (Sept.) James Grieve (Oct.), and quoted figures to show that a well managed plantation, twelve years planted, had made a profit of over forty pounds per acre over a series of years.

A Hereford grower stated that Cox's Orange could be grown successfully if the trees were summer pruned in August. Yellow Ingestre was also named as paying well (the Summer Golden Pippin of Kent).

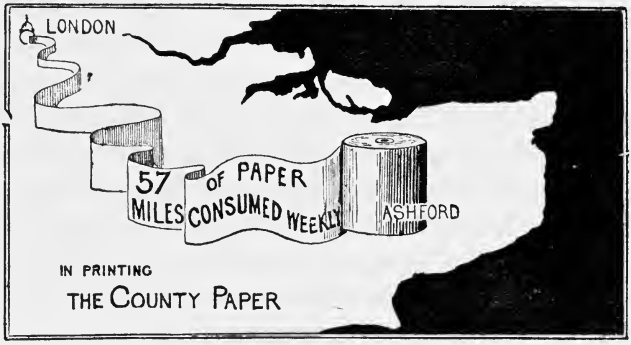
Attention was called to the damage done to the blossom and young foliage by Thrips, an application of Vaporite to the soil was regarded as the only remedy; sprayings are of little use.

A new fungoid disease was diagnosed by Professor Salmon, called "the stem disease of fruit trees." It in some way appears to kill the inner bark of the tree stems and branches, causing the stems to flatten out and eventually to die. Too rich soil and deep planting also induce attacks. The Author is, however, inclined to think that the damage is more likely to be caused by severe frosts, as the affected trees were such as grow very freely, and are not always fully ripened before the early autumn frosts appear.

The same speaker advised caution in spraying with Bordeaux mixture, some varieties losing all their leaves after an application. This points to the fact that it should not be used too strong until a test has been made on a few trees first.

It will be seen that the Conference mainly agreed with the practice recommended in "Fruit Farming," but the few additional facts were considered worth recording.

35,000 WEEKLY.



THE COUNTY PAPER OF KENT

. . IS . .

"The Kentish Express

AND

Ashford News."

IT has the largest circulation, and no one having the interests of his County at heart should miss buying it.

Everything of an Official character appears in its columns; the Farming side is carefully reported, and every important Sale is sure to be advertised there.

It is the recognised medium for all Kent County Council Notices, Auctioneers' Announcements, Farm and Fruit Sales, Estates to be Let and Sold, Situations Vacant and Servants wanting engagements.

Order your Newsagent to leave you one every week.

ONE PENNY WEEKLY.

HEAD OFFICE:—

94, High Street, ASHFORD, Kent.

The Insect and other Allied Pests

OF

Orchard, Bush & Hothouse Fruits

AND

Their Prevention and Treatment.

BY

FRED. V. THEOBALD, M.A., Etc.

Printed on Art paper; 566 pages and 326 original illustrations, mainly from photographs.

Price 30 SHILLINGS.

Published by the Author, WYE COURT, WYE, KENT.

SOME PRESS NOTICES.

"No fruit grower who means to advance in the profession can afford to be without this book."—*The Fruit Grower.*

"No man embarking on fruit growing as a whole can afford to leave a page unread. The illustrations are extraordinarily numerous, and in many cases beautiful." *The Standard.*

"No economic Zoologist nor intelligent gardener can afford to do without this excellent volume."—*Irish Gardening.*

Pour ce qui est des amateurs et des propriétaires de verger, ce lévre leur est indispensable."—*La Tribune Horticole.*

"No fruit grower can afford to disregard so important and helpful a record." *Gardeners' Chronicle.*

"Should prove almost indispensable to the fruit grower."—*The Scotsman.*

"Should be in the hands of every economic entomologist."—*Journal of Economic Entomology, U.S.A.*

"The most comprehensive work on the subject yet published."—*Journal of Horticulture.*

Important to Gardeners, Hop and Fruit Growers.

"NIQUAS" (Registered)

The most successful Non-Poisonous Insecticide of the day.

Its advantages are certain death to all Insect Pests. No possible injury to the most delicate Plant, Flower or Foliage. It is by far the cheapest Insecticide known. One pint makes 10 to 12 gallons for Thrip, Black and Green Fly, etc., whilst Red Spider, Mealy Bug, and Scale can be thoroughly eradicated by using "**Niquas**" about double the strength required for Fly.

It is most successfully used by Orange and other Fruit Growers in the Colonies, etc.

Prices: Pint, **1/-**; Quart, **1/9**; ½-Gallon, **3/-**; Gallon, **5/-**; Kegs, each 5 Gallons, **22/6**; 10 Gallons, **42/6**.

LETHORION IMPROVED METAL VAPOUR CONE FUMIGATOR

at greatly reduced prices.

Cone No. 3, for a well-secured house of **2,000** to **2,500** cubic feet, **1/-** each.
Cone No. 2, for a well-secured house of **1,000** to **2,000** cubic feet, **8d.** each.
Cone No. 1, Carbon, for frames of **100** cubic feet, **6d.**

STANDEN'S MANURE.

Established 40 years.

Exceeds all others in general fertilizing properties and staying power. Greatly reduced prices. The smallest quantity applied will give results.

Prices: In Tins, **6d., 1/-, 2/6, 5/6,** each; in strong wooden Kegs, ¼-cwt., **7/6**; ½-cwt., **12/6**; 1-cwt., **20/-** each. **Write for Analysis.**

FOWLER'S LAWN SAND.

Non-Poisonous. Introduced 1877.

A certain and effectual destroyer of Daises, Plantains, and Weeds, generally so troublesome and unsightly on Lawns. Renovator also of old and decayed Lawns.

All Lawns should be dressed at least twice a year with this article, its fertilizing properties alone being equal, if not superior, to anything at present offered.

Prices:—

Tins, **1/-, 2/6, 5/-** each; Kegs, ¼-cwt., **8/6**; ½-cwt., **16/-**; 1-cwt., **30/-** each.

To be had from all dealers in Horticultural Sundries throughout the Kingdom

Manufactured by:—

CORRY & Co., Ltd., BONDED CHEMICAL WORKS,

Shad Thames, LONDON, S.E.

Chapman's VICTA Tree Grease

(**V**ery **I**ndispensable **C**omposition **T**o **A**pply).

Contains all the essentials of a Perfect Fruit Tree Dressing.

The principal distinguishing features of this Grease are its Quality and Cheapness.

Prices :—

In Bulk, **£20** per ton ; **21/6** per cwt. ; **12/-** per 56 lb. ; **6/6** per 28 lb. Empties not charged for.

. . VICTA . . GREASE PROOF PAPER,

Cut to size, 30-in. × $6\frac{2}{3}$-in.

In Bulk, **28/-** per cwt. Smaller quantities, **3½**d. per lb.

Write for a Free Copy of

"PRACTICAL HINTS on the GREASE BANDING of FRUIT TREES,"

By HOWARD CHAPMAN,

Inventor of the Lime and Salt Process for Insect Pests.

Sole Maker:—

HOWARD CHAPMAN,

Western Cross Farm,

GREENHITHE, Kent.

"ABOL" WHITE'S SUPERIOR

TRADE MARK

NON-POISONOUS
PROTECTED BY LETTERS PATENT
INSECTICIDE

After an Eighteen Months' Test Proves Unequalled.

The Testimony.

"I used 'Abol' during 18 months at Forde Abbey, Chard, Somerset. The marvel is the way it kills all Aphides. Nothing could be more satisfactory for killing APHIDES, ON CHERRIES, PLUMS, APRICOTS, etc. I tried it on GOOSEBERRIES and CURRANTS infested with CATERPILLARS, applying it with force from the 'Abol' Syringe, and the EFFECT WAS MAGICAL. I consider it THE BEST INSECTICIDE I HAVE USED DURING MY FORTY YEARS' EXPERIENCE, HAVING TRIED A GREAT NUMBER.

JOHN CROOK, F.R.H.S., F.A.S.,
"Fingest," The Avenue, Camberley, Surrey.

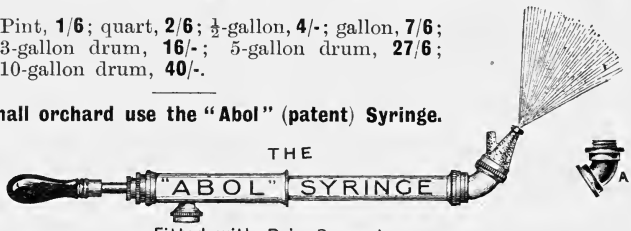
Treatise "D" with full information on **"INSECT PESTS AND MILDEW," gratis,** post free.

"Abol" (W.S.) kills Red Spider, Caterpillars, Mealy Bug, Green and Black Fly, American Blight, and Mildew on Roses and other Plants.

"Abol" (W.S.) prevents Peach Curl.

Prices: Pint, **1/6**; quart, **2/6**; ½-gallon, **4/-**; gallon, **7/6**; 3-gallon drum, **16/-**; 5-gallon drum, **27/6**; 10-gallon drum, **40/-**.

In a small orchard use the "Abol" (patent) Syringe.



Fitted with Drip Preventer.

No. 4, 1 × 14-in., **8/6.** **No. 2,** 1 × 20-in., **10/6.** **No. 6,** 1¼ × 20-in., **14/6.**
Bends, "**A**," **1/6** extra.

Specially recommended by the National Rose Society.

"Spraying is now a Pleasure instead of a Terror."
GEO. MASSE, Esq., V.M.H., F.L.S., Royal Gardens, Kew.

OF ALL SEEDSMEN, IRONMONGERS AND THE STORES.

Sole Proprietors and Manufacturers:—

E. A. WHITE, Ltd., Fruit Growers,
116, BELTRING, PADDOCK WOOD, Kent.

INDISPENSABLES TO PROFITABLE FRUIT FARMING.

Woburn Bordeaux Paste (Patent).

Apple Scab (Fusicladium dendriticum).

A new improved, concentrated, and much cheaper form of Bordeaux Mixture.

The best remedy for Apple and Pear Scab, Brown Rot of Fruit, Peach Leaf Curl, Potato Disease, etc.

Full particulars and price on application.

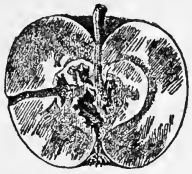
Carlton Arsenate of Lead Paste.

British and Best. The kind that sticks. Low in price. We are the actual Manufacturers.

Do not be persuaded into buying elsewhere and paying exorbitant prices.

No brand excels the "Carlton."

The best remedy for Caterpillar.



Section of Apple showing the work of the Caterpillar of the Codling Moth.

Woburn Tobacco Extract.

American Blight

The accepted remedy for Apple Sucker, Aphis (including American Blight), **Thrip, Cuckoo Spit, etc.**

Apple Sucker (Psylla Mali). Perfect Insect.

Insist on having "Woburn," the original.

NOTE.—*The above three washes can be mixed together and used at one spraying, thereby showing a considerable saving in labour.*

Voss' Fruit Tree Banding Grease

Winged Male of the Mottled Umber or Great Winter Moth (Hybernia defoliaria.)

Remains unexcelled for trapping the females of the **Winter, March and Mottled Umber Moths,** and preventing **Caterpillar.**

CHEAPEST AND BEST.

Wingless Female of the Mottled Umber or Great Winter Moth (Hybernia defoliaria.)

Winter Washes and all Horticultural requirements a speciality.

Full particulars from—

WALTER VOSS & Co., Ltd.,

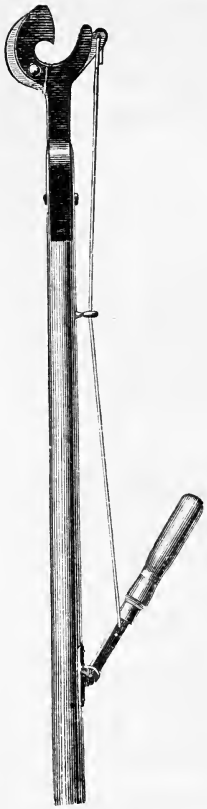
3b, MILLWALL, LONDON, E.

COPPIN'S

PATENT IMPROVED TREE PRUNERS.

BY ROYAL LETTERS PATENT.

As used in the Prince of Wales's Gardens at Sandringham, and also in the Public and Private Parks and Gardens in the United Kingdom and abroad.



No. 2.

The Tree Pruners,

And their advantages over others.

1st.—No. 2 is the only Tree Pruner which commences the cut at the top of branch.

2nd.—By the circular action of the Blade, a much cleaner cut is obtained.

3rd.—The Spring makes it automatic in opening, and entirely does away the inconvenience of having to hold back the Lever for the same purpose.

4th.—Being made with Hook at the top, is a great advantage for pruning branches of an upright growth.

PRICES of No. 2 TREE PRUNERS.

2 ft. pole	... ...	4/6 each.
3 ft. ,,	... ...	5/- ,,
4 ft. ,,	... ...	5/6 ,,
5 ft. ,,	... ...	6/- ,,
6 ft. ,,	... ...	6/6 ,,
7 ft. ,,	... ...	7/- ,,
8 ft. ,,	... ...	7/6 ,,
9 ft. ,,	... ...	8/- ,,
10 ft. ,,	... ...	9/- ,,
11 ft. ,,	... ...	10/- ,,
12 ft. ,,	... ...	10/6 ,,

Above 12 ft. made to order.

Extra Blades, 1/6 each.

Price Lists Free on application to leading Ironmongers and Horticultural Sundriesmen, or Patentees.

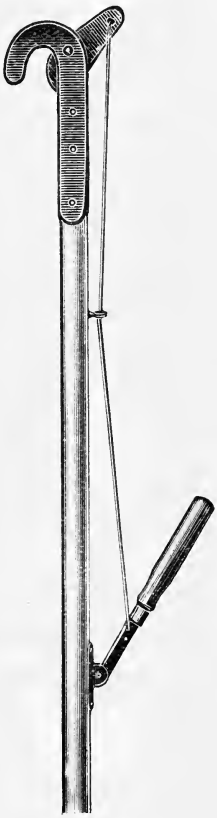
The "New Standard" Tree Pruner.

PRICES of COPPIN'S No. 3.

4 ft. pole	... ...	4/- each.
6 ft. ,,	... ...	5/- ,,
8 ft. ,,	... ...	6/- ,,
10 ft. ,,	... ...	7/- ,,
12 ft. ,,	... ...	8/- ,,

Saws to fit in place of Blade, 3/6 each.

Extra Blades, 1/- each.



No. 3.

Patentees and Sole Makers—

G. COPPIN & SONS, ADDINGTON, SURREY.

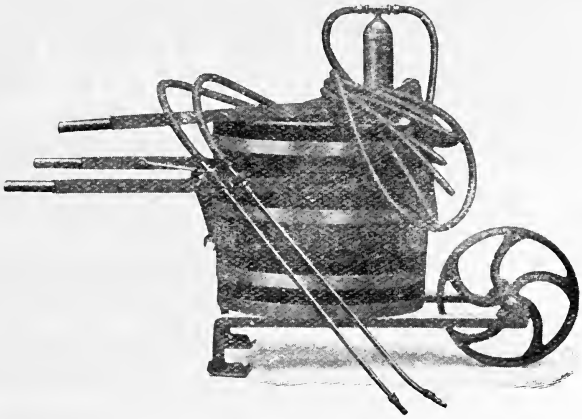
Spraying Machinery

OF ALL KINDS

For HOPS, FRUIT TREES, BUSH FRUIT, RUBBER, COFFEE & TEA PLANTATIONS.

OIL ENGINES and PUMPS

For Water Supply, Irrigation and General Estate Work.



Winners of:—Both First Prizes at Wisbech. Two Seconds at Gloucester.
Special £50, R.A.S.E. Gold Medal, Jamaica, etc., etc.

Makers to all the principal Spray Fluid Manufacturers, including :
Cooper & Nepheus. McDougall Bros. Voss & Co.
The Duke of Bedford's Experimental Farm.
A large number of Agricultural Colleges, County Councils, etc.

Makers of the New .

MISTIFIER Jnr. Spray Nozzle.

DRAKE & FLETCHER,

Engineers, **MAIDSTONE.**

RELIABLE SALESMEN.

LIVERPOOL,

NATIONAL TELEPHONE-1663 ROYAL.
TELEGRAMS-"WATERCRESS," LIVERPOOL.
POSTAL ADDRESS-10, QUEEN SQUARE.

10 & 11, Queen Square.
29 & 31, Great Nelson Street.
144, 145 & 146, Wholesale Markets, Cazneau St.

G. J. Bedford,

WHOLESALE SALESMAN OF

Fruits, Flowers, Salads & Vegetables.

Special attention given to English Produce. Account Sales daily
Cheques every Friday.

Charges for Fruits, 5 per cent., and 2d. per Package for Rents. Use and Carriage of Empties, etc.

Charges for Salads and Flowers, 7½ per cent., ditto.

READY SALE for all GOODS of RELIABLE QUALITY.

☛ **We require more Strawberries, Black and Red Currants, and Raspberries. Should be pleased to correspond with Growers.**

Prompt Returns & Best Market Prices Guaranteed.

Bankers: THE LONDON CITY & MIDLAND (Market Branch).

ESTABLISHED BY G. J. BEDFORD, 1881.

RELIABLE SALESMEN.

CHAMPION BROS.,

FRUIT, PEA AND POTATO SALESMEN,

Borough and Covent Garden Markets,

LONDON.

Receive for Sale all kinds of Fruit, Vegetables and Potatoes, and Supply Baskets on application.

References—London Joint Stock Bank, Southwark, S.E.

Terms on Application. Cheques Weekly.

Telegrams:
"Thurlow, Spitalfields, London."

Telephone:
No. 9627, London Wall.

Established 1850.

R. Thurlow & Sons,

Fruit, Pea and Potato Salesmen,

SPITALFIELDS MARKET, LONDON, E.,

Solicit Consignments of

Fruits, Potatoes & Vegetables.

Bankers: LONDON CITY & MIDLAND, Shoreditch, E.

LABELS, EMPTIES, etc., ON APPLICATION.

No connection with any person or firm using same name or any address other than above.

GEORGE MENCE SMITH

Supplies at Lowest Possible Prices,

ALL FARMERS', HOP & FRUIT GROWERS' SPECIALITIES.

Coir Yarn.	Arsenate of Soda.
Raffia.	Arsenate of Lead.
Soft Soap.	Sulphate of Copper.
Quassia Chips.	Caustic Soda.
Quassia Soft Soap.	Banding Grease for Trees.
Liver of Sulphur.	Banding Paper for Trees.
Grafting Wax.	Paints, Oils, Varnishes,
Acetate of Lead.	etc., etc.

OIL, COLOUR & GENERAL MERCHANT,

19, High Street, MAIDSTONE, Kent.

Kent Insurance Company

ESTABLISHED 1802.

(Now merged in the Royal Insurance Co., Ltd.)

Total Funds - - - £16,630,262.

Income - - - - £5,828,309.

LOCAL CHAIRMAN - GEORGE MARSHAM, ESQ.

FIRE DEPARTMENT.—Claims promptly and equitably settled.
LIFE DEPARTMENT.—Large participation in profits.

Personal Accident. Burglary. Workmen's Compensation.
Fidelity Guarantee. Property Owners' Liability. Third Party.
Plate Glass. Loss of Profits by Fire, Marine, etc.

Forms and Prospectuses on application to KENT OFFICE, MAIDSTONE; or to any of the Company's Representatives.

J. DALBY HOBSON, Local Secretary. EDWIN RUCK, Assistant Secretary.

GOLD MEDAL, after exhaustive trials,
Hexham Fruit Congress, October, 1910.

FIRST AWARD, Middlesex Demonstration.

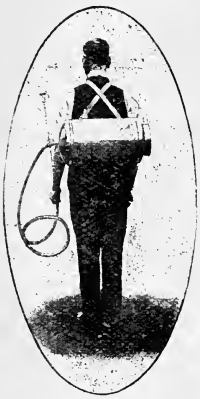
also

13 other Medals and Diplomas since Sept., 1909.

No other sprayer can be compared with it for efficiency and simplicity; no work, no trouble, never gets out of order, no continuous pumping. One person only required to use any size machine.

Charged with compressed air by means of an ordinary bicycle foot pump.

What the Royal Horticultural Society think of this Sprayer:—
"We consider this to be one of the finest Sprayers on the market."
From R.H.S. Report in Journal, March, 1910.



No. 5.

The Alpha,

KING OF SPRAYERS,

For use in Orchard, Garden, Greenhouse & Conservatory.

Can be used for Lime and Whitewash Spraying, Disinfecting, etc.

The Knapsack, 3½ gallons, awarded Gold Medal and First Diploma as above, complete with powerful foot pump, 60/-.

MADE IN SIX OTHER SIZES, DIFFERENT PATTERNS.

1 quart, **15/-**; 2 quarts, **16/6**; 3 quarts, **17/6**; 1½ gallons, **47/6**; 3½ gallons special Lime and Whitewash Spraying Machine, **58/6**; 5-gallon Sprayer, suitable for any purpose, **75/-**.

Any Tree Spraying Solution or Insect-Killer may be used with wonderful effect in these machines.

Full particulars and Illustrated Price List on application to—

ALPHA EXTINGUISHER, LTD.,
ROSS, HEREFORDSHIRE.

AGENTS WANTED WHERE NOT REPRESENTED.

"THE SOUTH EASTERN GAZETTE."

The leading Newspaper, for Farmers and all interested in the land, in the County of Kent.

Principal Medium for Auctioneers' & Estate Agents' Notices

Regular weekly features include
Special Reports on Markets, the Hop Crop, Fruit prospects, etc.

"THE SOUTH EASTERN GAZETTE"

Published Monday evening for Tuesday, price One Penny. Post Free, 3s. 3d. half-yearly.

SATURDAY EDITION price One Half-penny.

Proprietors :—

The South Eastern Gazette Newspaper Co., Ltd.,
Head Offices : 56, Week Street, MAIDSTONE.

The Family County Paper of Kent.

"We find that we get more results from your Paper than from all the other Kent Papers and we have tried them all for over four years. "Yours faithfully,
"JOHN C. MURDOCH & Co., Ltd.,
"F. Proctor, *Manager.*
"78, Week Street, Maidstone."

(The above letter was entirely unsolicited.)

"KENT MESSENGER & MAIDSTONE TELEGRAPH."

Printed on a 12-page Foster Machine.

Established 51 years

Displayed Advertisements.

13 insertions **2s. 6d.** per inch per insertion.

TYPE OR BLOCKS.

There is no Newspaper printed in the County Town of Kent that can compare with the CIRCULATION of the "KENT MESSENGER."

HEAD OFFICES: WEEK STREET, MAIDSTONE.

Branch Offices:—187, Parrock Street, GRAVESEND;
Dorset Street, SEVENOAKS; and 26, Bank Street, ASHFORD.
London Office: 115, FLEET ST. Proprietor: BARHAM PRATT BOORMAN.
FRIDAY & SATURDAY—ONE PENNY. WEDNESDAY—ONE HALF-PENNY.

"Kent Messenger & Gravesend Telegraph & Dartford News."
"Kent Messenger & Sevenoaks Telegraph."

VERMOREL'S KNAPSACK SPRAYERS,

For FRUIT TREES, HOPS, POTATOES, etc.
The BEST and MOST RELIABLE.

☛ Have won over 500 FIRST PRIZES and MEDALS.

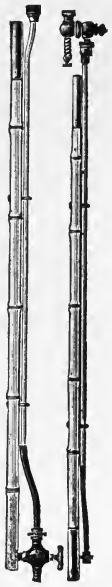
Has never been beaten in competition.
Recommended by all Authorities.

The "ECLAIR," for liquids,

Gives a very fine, a medium, or a coarse spray, and is the best distributor of either thick or thin fluids.

Has a powerful agitator, and plenty of force behind the spray.

Price—£1 15s. 6d.



LONG TUBES for spraying tall trees.—

(Bamboo Lance, fitted with light copper tubing and tap).

4ft. 10in., 10/6; 6ft. 6in., 12/6; 8ft. 1in., 14/6; 9ft. 9in., 18/6; 13ft., 22/6; 16ft. 3in., 25/6.

The three largest sizes are in two pieces; either half can be used separately by affixing an extra top and nozzle.

The "TORPILLE," for powders.

For dusting powders of every description.

Prices No. 1, 24/6; No. 2, 18/-

Double action "Torpille," **33/6.**

"VERMORITE," a spraying mixture, for instantaneous use.

Sole Agents for the United Kingdom and the Colonies:—

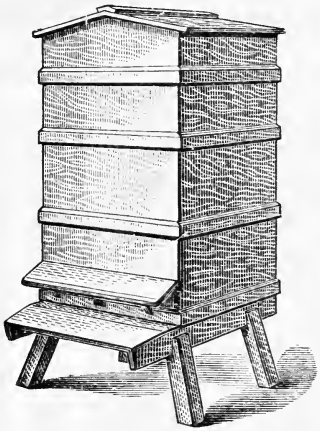
COOPER, PEGLER & Co.,

24, 26, Christopher Street, Finsbury Square,

LONDON, E.C.

C. T. OVERTON & SONS,

CRAWLEY, SUSSEX,



MANUFACTURERS OF

BEE HIVES AND BEE APPLIANCES of every description.

BREEDERS and Importers of Ligurian Carniolan and English Bees and Queens.
Stocks and Swarms. *See Catalogue.*

Lectures & Instruction given in Bee-keeping.
TERMS MODERATE.

Illustrated Catalogue Free to any address.

KINDLY MENTION THIS BOOK.

GEORGE BUNYARD & Co., Ltd.

HAVE BEEN

Awarded many CUPS, GOLD and SILVER MEDALS, and HUNDREDS OF FIRST PRIZES,

FOR THEIR EXAMPLES OF

Apples, Pears, Cherries, etc.,

At all the FIRST-CLASS COMPETITIONS.

Champion Exhibitors of Hardy Fruits for 26 years.

THE above Fruit has been grown by them in their Nurseries, and Visitors can always see 400 kinds of **Apples & Pears** on the Trees or in their Fruit Room, from October to February; Peaches and Nectarines, in Orchard Houses—July to October.

Such important practical knowledge of Pomology, gained over so many years, combined with extensive trials, has made the **Maidstone Nurseries** distinguished for selling **Fruit Trees true to name;** healthy and vigorous in growth.

Many Colonial Governments, as well as County Councils and the trade, have availed themselves of this fact, in order to get true stock for comparison and propagation.

As far as can be spared, Collections or single examples can be supplied for County Council educational purposes or comparison, but not for competition at Exhibitions.

"Kent, the Garden of England."

— NEARLY —

A MILLION FRUIT TREES,

In 600 SORTS,

TRUE TO NAME, CLEAN AND HEALTHY IN GROWTH,
ARE GROWN ANNUALLY AT

GEORGE BUNYARD & Co.'s

FRUIT TREE NURSERIES,

ESTABLISHED 1796.

MAIDSTONE.

SPECIAL ATTENTION is given to PROFITABLE MARKET SORTS.

Illustrated Descriptive Fruit Catalogue, Post-free Six Stamps.
Market Growers' List, free.

G. B. & Co., Ltd., are also Extensive General Nurserymen, and will forward the following Lists free:

THE DESCRIPTIVE & CULTURAL CATALOGUE OF STRAWBERRIES.
THE GENERAL TREE & SHRUB CATALOGUE.
LIST OF HERBACEOUS PLANTS, AQUATICS, etc.
LIST OF HARDY CLIMBERS.
THE DESCRIPTIVE LIST OF ROSES.
DESCRIPTIVE GENERAL SEED & SUNDRIES LIST.
ASPARAGUS—CULTURE & PRICES.

All these Catalogues are Copyright, and entered at Stationers' Hall.

LIBERAL TERMS, FREE CARRIAGE AND DISCOUNT, DISTANCE NO OBJECT.

Everyone contemplating FRUIT FARMING should pay these Nurseries a visit, and see examples of up-to-date Culture and Pruning. *For Route, see Catalogue.*

TOOLS, etc., for use in FRUIT PLANTATIONS,

MAY BE OBTAINED DIRECT FROM

GEORGE BUNYARD & Co., Ltd.

PINCHES' ACME LABELS, practically imperishable, strongly recommended, any names to order, per whole gross, 20/-; per doz., 2/6; each 3d.; post free, to customers' names.

STANDARD TREE PRUNERS (*see advertisement page vii*).

PRUNING KNIVES (clasp), special Sheffield make, each 2/9 to 3/6.

PRUNING KNIVES (sheath), for Cob Nuts, etc., each 2/6.

SECATEURS FOR PRUNING, 3/6 to 5/6 per pair.

TAM O'SHANTER HONES, for sharpening above, each 6d.

PRUNING SAWS, "American Two-edged Lightning," each 3/6 & 4/6.

KENT HAND BILLS, for lopping, each 3/6.

DIGGING FORKS, cast steel, four prongs, each 4/- and 5/-.

BUNYARD'S SPECIAL PLANTING SPADES, extra strong, strapped, cast steel, as used in the Nursery, each 6/-.

GALVANIZED WIRE GUARDS, for protecting stems of Standard Trees, very effective, price per 100, 30/- to 50/-. Better than when cut from a roll.

PLANET JUNIOR, HORSE, PONY OR DONKEY HOES, very useful, and much ussd in our Nurseries.

VERMOREL'S KNAPSACK SPRAYERS, and the new English make, from 36/6 (*see advertisement page xiv*).

QUASSIA CHIPS in quantity, price on application.

TOBACCO DUST, per cwt., price on application.

HELLEBORE POWDER, 6d. and 8d. per lb.; per cwt. on application.

GLOVES, strong leather pruning, per pair, 1/- to 1/8.

GREASE SMEAR, for dressing Trees to prevent Winter Moth; 56 lb., 12/6; cwt. casks, 21/-.

HOWARD CHAPMAN'S GREASE in stock, (*see advertisement page iv*).

BUNYARD'S AMERICAN BLIGHT AND INSECT CURE, per gallon, 5/-; five-gallon drums, 17/6.

BUNYARD'S SPECIFIC for Mildew and Curl on Peach foliage, 1/- & 2/6.

Fruit Farming and Gardening.

Mr. GEORGE BUNYARD, F.R.H.S., V.M.H.,

(Acting Member of the Chiswick Fruit Congresses;
Chairman of the Fruit Committee Royal Horticultural Society;
Chairman of the Edinboro' Apple and Pear Conference;
For 50 years connected with the Maidstone Nurseries;
Master of the Fruiterers' Company, 1906.)

WILL (in Summer, by preference) be willing to give his services to Noblemen, Land Owners, or Farmers, who require practical professional assistance or

Advice on Market Fruit Culture

. or the Formation of Modern .

Fruit or Rose Gardens, etc., etc.

Terms on Application to . .

THE ROYAL NURSERIES, MAIDSTONE.

Fruit will be named for Customers and Friends if sent Carriage Paid, with Stamped Addressed Envelope, but non-customers and the Trade will be asked for a fee of 1/- for every dozen or less, which will be handed to the Gardening Charities.

LITERATURE OF FRUIT CULTURE.

The following Works are considered the best on their several subjects, and may be purchased through any Bookseller, or be posted direct from GEORGE BUNYARD & CO., LTD., the Royal Nurseries, Maidstone, at the prices affixed, net.

The notes in parenthesis are the Author's.

The Standard Book.—"The Fruit Garden."—This important work contains about 400 Illustrations, and practical information of every kind relating to Fruit Culture, Insects, etc. By GEORGE BUNYARD, V.M.H., and OWEN THOMAS, V.M.H. In One Volume. "The best and most important yet published." 13/- net.

Bunyard's Modern Fruit and Rose Culture, for Amateurs.
The set embraces :—Hints for the culture of Apricots, Peaches and Nectarines, Pears, Apples and Plums for Villa Gardens; Cordon and Candelabra Trees ; Strawberries in the open, or for forcing ; and the management of Orchard-house Trees, hints on Root-pruning, Rose Culture, etc. 1/- post free.

National Rose Society's Descriptive Catalogue, 2/2; also hints on Rose Culture.

"England's National Flower."—Mr. G. B. has written a practical little manual with descriptions of ROSES grouped in families for special purposes, illustrated by photographs taken specially for this work by Mr. E. A. BUNYARD. It contains hints for culture, and will be specially valuable for amateurs who are often at sea with a catalogue that contains hundreds of varieties. 3/9 post free. Favourably reviewed by all Papers. See Rose Catalogue.

Rev. A. Foster-Melliar's Book of the Rose. "Practical and a treat to read." 6/6.

Royal Horticultural Society's Rules for Judging Fruit, Vegetables and Flowers, 1/9.

Fruits for Cottagers.—R.H.S. pamphlets, containing valuable and simple hints for culture, of profitable sorts, etc., each 2d., or six for 7d.

How to Build a Fruit Room on G. B. & Co.'s Plan, with two photographs. 2/6 post free.

Vines and Vine Culture, by A. F. BARRON, late Superintendent of the Royal Horticultural Gardens. 5/6.
(The most complete work yet published ; every detail given.)

Profitable Fruit Growing, by J. WRIGHT. 1/2. Fifth edition revised.
(The Prize Essay of the Fruiterers' Company, 1889. A most practical and valuable work for small growers, Cottage or Allotment holders, freely illustrated, and valuable for its sound teaching. Just the work for distributon among Cottage Garden Societies, etc.)

A Year's Work on a Kent Fruit Farm. A practical series of capital articles ; highly recommended. (Copyright). 1/-.

Board of Agriculture Leaflets post free as per List, see Chapter XXIII.

Fruiterers' Company Charts, illustrating Budding, Grafting, Layering, Pruning, etc. ; on cards of large size, mounted, 6/- the set of five ; too large for post.

The Planter's Handbook of Shrubs and Trees, with list of the months they blossom. 3/9 post free.

YC 61744